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Full Name of Author — Nom complet de l'auteur

Amina Ali Beverly ~~Beverly Anne~~ Beecroft

Date of Birth — Date de naissance	Country of Birth — Lieu de naissance
Jan. 24/56	Canada

Permanent Address — Résidence fixe

#301-10405-Sask. Dr.
Edmonton, Alberta T6E 4R9

Title of Thesis — Titre de la thèse

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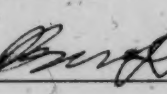
July 19/83	

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AMINA ALI BEVERLY BEECROFT

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.....
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.....

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ABSTRACT

This study deals with the serial sections of six transitional works of Stravinsky. Cantata, Septet, Three Songs from William Shakespeare, In Memoriam Dylan Thomas, Canticum Sacrum and Agon are generally understood as forming the link between the neoclassical and serial periods. The purpose of this study is to determine the extent to which the serial material dictates larger structures. This group of works evinces a broad and flexible approach to the manipulation of the series. Only two works, Three Songs and In Memoriam, contain serially derived material in each movement and the latter alone presents consistent pitch serialization. Twelve-note rows are not used until Canticum Sacrum and Agon and, unlike his later serial writing, these works use multiple rows. The other works all utilize fractional rows. Throughout this collection of works the series is used linearly and counterpointed against itself.

The discussion centres around compositionally significant structures within the row and how these structures affect the choice of transformations throughout the work. It is found that the majority of linear row relationships fall into two types. The first type deals with fractional rows or the hexachordal subdivisions of twelve-note rows and involves maximum pc invariance. While in some works invariant segments are freely and consistently distributed, pc invariance in other works suggest a specific structural function. The second type, which involves only fractional rows, deals with the

combination of row forms (usually row pairs) to establish a referential basis of pc content. Sections utilizing the referential collection are juxtaposed with sections of varying pc content. Another extension technique utilizes the referential collection initially and then enlarges the content to include the total chromatic. Some works (the "Dirge-Canons" of In Memoriam and the first of the Three Songs in particular) contain both methods of serial extension.

The overall form of each movement is also considered. In most cases "traditional" forms are utilized. Levels of ambiguity occur between structures on a number of different levels. An example of this is the second and fourth movements of Canticum Sacrum, where an outer ternary structure is combined with an underlying internal symmetry.

The conclusions of this study summarize and relate Stravinsky's various serial usages. Two priorities are given consistent expression in these works; the chromatic pc collection and symmetry. The chromatic pc collection, occuring in the row structure or in the combination of row pairs, frequently functions as a referential pc group. This is consistent with Stravinsky's use of referential pc sets in earlier works and with chromatic collections associated with German atonal works of the early twentieth century. The second priority, symmetry, has been widely used throughout the twentieth century, particularly in the works of Webern. Stravinsky, however, often obscures the symmetry with additional material in the second half of the structure.

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CHAPTER 1: INTRODUCTION

This study will deal with a group of six works composed at the beginning of Stravinsky's third and last style period, the serial period. These works form the transition from Stravinsky's last neoclassical work, The Rake's Progress, to Threni, his first twelve-tone work in which all pitch material is serially organized. The six pieces studied are: Cantata (1952), Septet (1953), Three Songs from William Shakespeare (1954), In Memoriam Dylan Thomas (1954), Canticum Sacrum (1955) and Agon (1953-57). This study will be limited to the movements or sections of the above works which are serially organized. Each work will be examined separately with respect to the following: set structure, serial operations, structural potential of the set and larger structures and forms utilized. One chapter will be devoted to a detailed analysis of each work and the concluding chapter will examine the similarities and differences between structures and the rows used in each work.

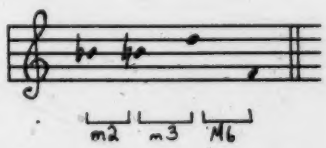
The analysis used throughout this study is statistical which, in most cases, reveals some significant structural features that have not been commented on previously. The method employed in the analysis is based on principles of set theory as discussed by Allen Forte.[1]

Throughout this study integer notation has been used, which involves representing pitch by numbers. As in tonal music, octave equivalence is assumed, which results in twelve distinct classes of

pitch (referred to as 'pitch class' or pc). Therefore, all pitches are represented by number. For example, C# and D♭ in any octave would receive the same integer in this notation. Throughout this study whenever integer notation is used C=0. Pc preservation does not retain the pcs in the same octave and the lines do not share the same contour. Pitch preservation does maintain the same contour and it is therefore important to note when this occurs. A pc set is a group of distinct pcs represented by integers. Pc sets may be ordered or unordered. Ordered pc sets retain the same sequence of pcs and, therefore, the interval sequence is also identical. Unordered pc sets maintain the same pcs but are permutated, introducing a new sequence of intervals.

Intervals may also be represented by number. Because octave equivalence is assumed in the notion of pc, complementary intervals (minor second-major seventh) are equivalent, which results in six interval classes (or ics). An interval class is determined by the numerical difference between two pcs, but must be a positive number. Figure 1.1 illustrates a pc set with four elements, both in musical

Figure 1.1. Pitch and Interval Classes

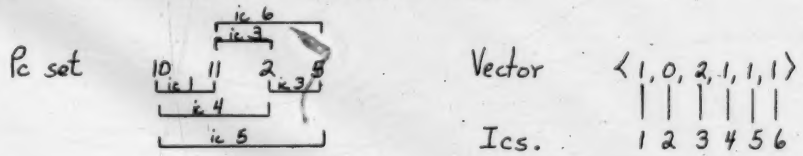


Pcs- 10 11 2 5

Ics- 1 - 3 - 3

notation and integer notation. The numerical difference of pcs results in the ics. This ordering of the pc set results in the ic sequence 1-3-3. A different ordering of these four pcs would produce a different ic sequence. An interval vector identifies all possible intervals within a pc set. The vector always contains six digits, representing ic 1 through 6 from left to right. Even if the entry is zero for some ic, it must be notated. The vector indicates the total number of ics available and any ordered version of a set will utilize only a portion of the total. To determine the interval vector the ics between all pairs of pc are calculated and then notated in the vector as shown in Figure 1.2. In this example,

Figure 1.2. Determination of Interval Vector

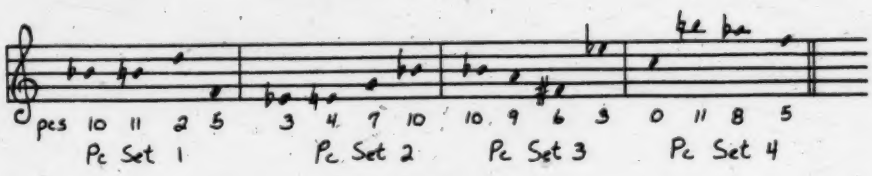


there are a total of six available ics, two are ic 3 and one each of ics 1, 4, 5 and 6. Vectors are included in this study for all series which contain less than the total chromatic.

Pc sets may be equivalent under the operation transposition. This is determined by the addition of the same integer to each element of the first set to produce the corresponding elements of the second, as shown in Figure 1.3a. The level of transposition is indicated by t= followed by the integer.

The operation inversion is treated differently when involving ordered or unordered pc sets. Because this study deals with serial

Figure 1.3. Equivalent Pc Sets



1.3a. Equivalent pc sets under transposition

Pc set 1	10	11	2	5
+5	5	5	5	5
Pc set 2	3	4	7	10

Sets are equivalent under transposition at t=5

1.3b. Equivalent pc sets under inversion

Pc set 1	$10_{\uparrow 1}$	$11_{\uparrow 3}$	$2_{\uparrow 3}$	5
Pc set 3	$10_{\downarrow 1}$	$9_{\downarrow 3}$	$6_{\downarrow 3}$	3 (untransposed inversion)
Pc set 4	0	11	8	5 (inversion t=2)

material usually presented in an ordered format, this is the only type of inversional relationship that will be examined. For ordered pc sets, inversion requires that the sequence of ics be the same but the complementary interval be utilized, as illustrated in Figure 1.3b. An untransposed inversion would begin on the same pc as the original, although inversion may be followed by the operation transposition.

The naming of serial transformations is not consistent throughout the literature. In this study I have chosen the method outlined in the Dictionary of Contemporary Music.[2] This system uses P_o for the prime series and the subscript indicates the transposition level in semitones above the original. The retrograde of the prime is

notated P_oR, indicating its relationship to the prime. The inversional row beginning on the same pc as the prime is notated I_o. The retrograde inversional row is notated I_oR, relating it to the inversional row in reverse order. In a few pieces Stravinsky has used a retrograde inversional row which is related to the prime retrograde, rather than the inversion, and it is notated R_oI. Throughout this study the term row form refers to the type of serial transformation used without regard to the transpositional level (P, R, I or RI). The term row form is used when a sequence of serial statements are related by serial transformations, the majority of which are untransposed.

A sequence of serial statements may be adjacent (with no common pc between series) or linked (with at least one common pc between series). In some cases a link is possible with as many as two or three common elements. Adjacent fractional rows or hexachords of twelve-note rows may involve combinatoriality.[3] Two simultaneous hexachords which provide the total chromatic but no discernible order are called an aggregate set. A secondary set involves two consecutive hexachords which provide the total chromatic and a discernible order, although the order is different than that of the prime.

The technique of rotation involves ordered pc sets. Two pc sets are involved and although the order is the same, one begins on an element other than the first (see Figure 1.4). Rotation may begin on any element of the set and the set may contain any number of elements.

Figure 1.4. Rotation Technique

Pc set 1	10	11	2	5
Rotation to begin on 2nd element	11	2	5	10
Rotation to begin on 3rd element	2	5	10	11
Rotation to begin on 4th element	5	10	11	2

NOTES

[1]Allen Forte, The Structure of Atonal Music (New Haven: Yale University Press, 1973), pp. 1-92. Also see John Rahn, Basic Atonal Theory (New York: Longman, 1980).

[2]Brian Fennelly, "12-Tone Techniques," Dictionary of Contemporary Music (New York: E.P. Dutton and Co. Inc., 1974), p. 773.

[3]Ibid., p. 775.

CHAPTER 2: CANTATA

The Cantata was completed in 1952 and is Stravinsky's first composition which utilizes serial techniques. This work is in seven movements. Odd-numbered movements use verses of the "Lyke-Wake Dirge" as text while repeating the music. The second movement, "Ricercar I", is for solo soprano, two flutes, oboe, english horn and 'cello and is entitled "The maidens came." The fourth movement, "Ricercar II", entitled "To-morrow shall be" is set for solo tenor, two flutes, two oboes and 'cello. The sixth movement, "Westron Wind", is a duet for soprano and tenor accompanied by two flutes, oboe, english horn and 'cello.

The only movements which utilize serial techniques are the "Ricercar I" and "Ricercar II." In the original program notes Stravinsky writes:

> I use the term 'Ricercar' not in the same sense that Bach used it to distinguish certain strict 'alla breve' fugues, as for example the six-part Ricercar in the Musical Offering, but in its earlier designation of a composition in canonic style.[1]

Both of the ricercar movements involve canonic style. The "Ricercar I" involves imitation of a given part in both pitch and rhythm and, thus, is truly canonic. The "Ricercar II" utilizes imitation only with respect to pitch and uses transformations and transpositions with little or no regard to rhythmic identity. "Ricercar II", then, is truly serial and as such will be the only movement dealt with in this study.

"Ricercar II" is the central movement of the Cantata and is a binary structure (AB). The A section consists of three statements of the "cantus cancrizans", each separated by a ritornello, and the B section consists of nine canons each separated by a ritornello, which is similar to that of the A section. Although Stravinsky has indicated that the second section is canonic, "the term refers here only to the pitch organization established by the row; rhythmic imitation is almost totally lacking."[2]

The series, as shown in Figure 2.1, is stated by two flutes

Figure 2.1. Series used in "Ricercar II"

$P_0 = 4\ 0\ 2\ 4\ 5\ 3\ 2\ 4\ 0\ 2\ 11$ (4 −2 −2 −1 −2 −1 −2 −4 −2 −3) $\langle 4,3,3,2,2,1 \rangle$

pc content $\{11,0,2,3,4,5\}$

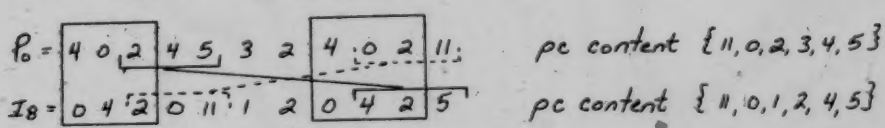
and 'cello in a one-bar introduction and is the basis of all material in the solo line (except for the ritornello sections)[3] and much of the accompanimental material. Although eleven pc representatives are stated, only six different pcs are utilized, which results in an unequal distribution of the twelve chromatic notes. The series is characterized by nonconsecutive repetition of pcs. This distinguishes the series from traditional serial practice. The repeated pcs become dominant aurally. For example, within the prime row, the pcs stated multiply are 0, 2 and 4 and the total pc content belongs to a C scale with a split third (pcs 3 and 4 both present). The restated pcs, then, can be seen to be important to the determination of the pitch centre (although not a traditional tonal centre). The structural significance of the recurrent pcs is exemplified

by Stravinsky when he consistently refers to transpositions of the row in terms of tonality.[4]

Also included in this series is the repetition of a two-note and three-note segment (pcs 4, 0, 2 and 2, 4) and the inclusion of a diatonic scale fragment (pcs 0, 2, 4, 5).

The structure of the series is such that pc identity is not maintained under the operations inversion or transposition. Maximal pc intersection (five pcs in common) is available between P_0 and I_8, as shown in Figure 2.2. If we compare the pc contents of the sets,

Figure 2.2. Maximum Pc Intersection



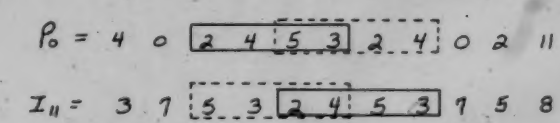
we find that they contain the same final elements (pcs 11 and 5). There is one new pc in I_8 (pc 1) and in combination the two sets produce all the chromatic pcs between 11 and 5. The same recurrent pcs (4, 0, 2) occur in these two sets and the initial pc pair (0, 4) is also preserved, although the elements of the pair are reversed. These two sets hold two unordered three-note segments invariant (pcs 2, 4, 5 and 0, 2, 11), although the order positions of these segments are exchanged. All elements of these sets are included in invariant relationships except the central elements (order position six), which is the one pc unique to each row. This pair of rows represents the maximal level of invariance available within permutations of the series.

These combined constraints of pitch content and pitch order reflect a continuation of the Stravinskyian concern with the

> time rate of change of pitch replacement, as does the very structure of the serial unit, the placement of whose repeated pitches results in the avoidance of the repetition of a temporal distance between such pitches, be that distance measured in terms of the duration resulting from the assignment of rhythmic values or merely in terms of the number of intervening pitches. The assignment of repetitions within the unit so that notes so emphasized are retained under that inversion which creates maximal pitch intersection, may be taken as a vestigial, if highly refined, manifestation of ostinato technique, but--in all accuracy--it is more closely related to the concern for pitch replacement and retention; 5

There is a variety of rows which holds segments of P_0 invariant. Figure 2.3 shows the only four-note segments which are held invariant.

Figure 2.3. Invariance of Four-note Segments

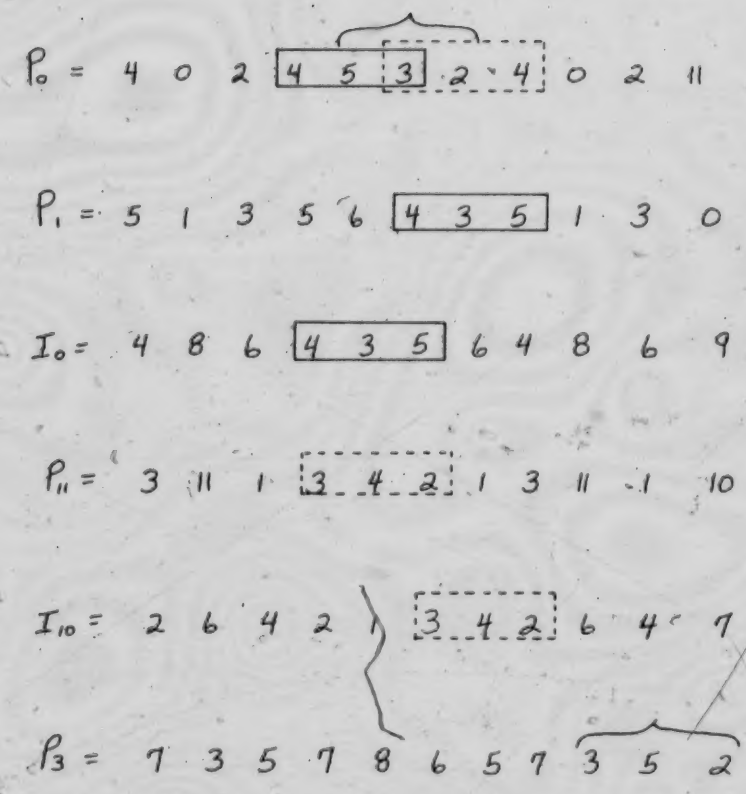


There are, in fact, two ordered sets, consisting of four chromatic pcs, which remain invariant and occupy order positions three through eight of each row. The number of rows holding three-note segments invariant with P_0 are much greater and are shown in Figure 2.4.

It is interesting that, although the pc content of the basic series consists of six pcs, a complementary set does not exist within the serial transformations. As a result, any two sets have at least one common element and the total chromatic can't be produced from two sets.

> There are several features in which Stravinsky's use of the row deviates from customary serial procedures. With the exception of the ritornelli, the row is present in the vocal line throughout the movement but it is always accompanied by at least one instrumental part which is not immediately referable to it. In addition, the row is used only horizontally, as a melodic and contrapuntal source, in the vocal line it even preserves its original melodic contour (or its inversion) with every statement, although this is not always true when it appears

Figure 2.4. Invariance of Three-note Segments



in the instruments.[6]

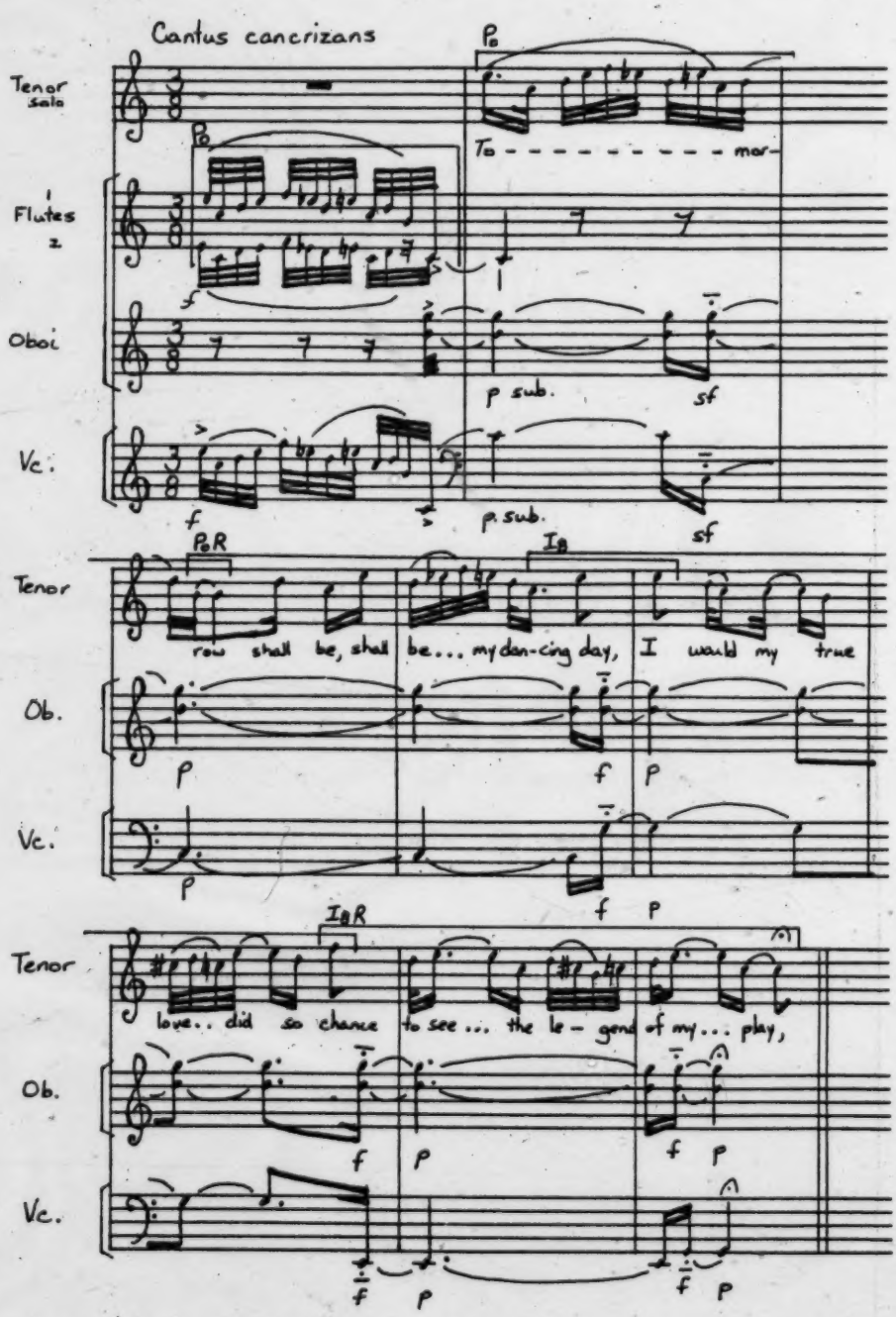
After the one-bar introduction, which states the series instrumentally, the "cantus cancrizans" section begins (see Example 1). "Cantus cancrizans" literally means song in crab or retrograde form. This section is divided into three cancrizans statements each separated by a nonserial ritornello. The serial statements of the tenor line of this section are shown in Figure 2.5. There are only two series used,

Figure 2.5. Series of Tenor Line in "Cantus Cancrizans"

$$\overset{R}{\overbrace{P_o\ P_o}}R\ \overset{R}{\overbrace{I_\beta\ I_\beta}}R\ \text{Rit.}\ \overset{R}{\overbrace{P_o\ P_o}}R\ \overset{R}{\overbrace{P_o\ P_o}}R\ I_\beta\ \overset{R}{\overbrace{I_\beta}}R\ \text{Rit.}\ \overset{R}{\overbrace{P_o\ P_o}}R$$

P_o and I_β and their retrogrades. As has been mentioned, there are many invariant relationships between these two sets. The series of this section are arranged in pairs, each having a retrograde relation. Variety between the three sections is achieved by the number of serial statements. The first section consists of P_o and its retrograde followed by I_β and its retrograde, the second section is identical except that the first row pair is repeated and the third section is abbreviated, stating only the first row pair. The accompanimental lines to the "cantus cancrizans" are not serially organized. The accompaniment sustains pcs which support the centricity of the solo line. For the most part, the pcs sustained are 0, 7 and 2, a pair of open fifths which outline a simultaneous tonic and dominant chord in C. Throughout the central section the winds imitate the solo line.

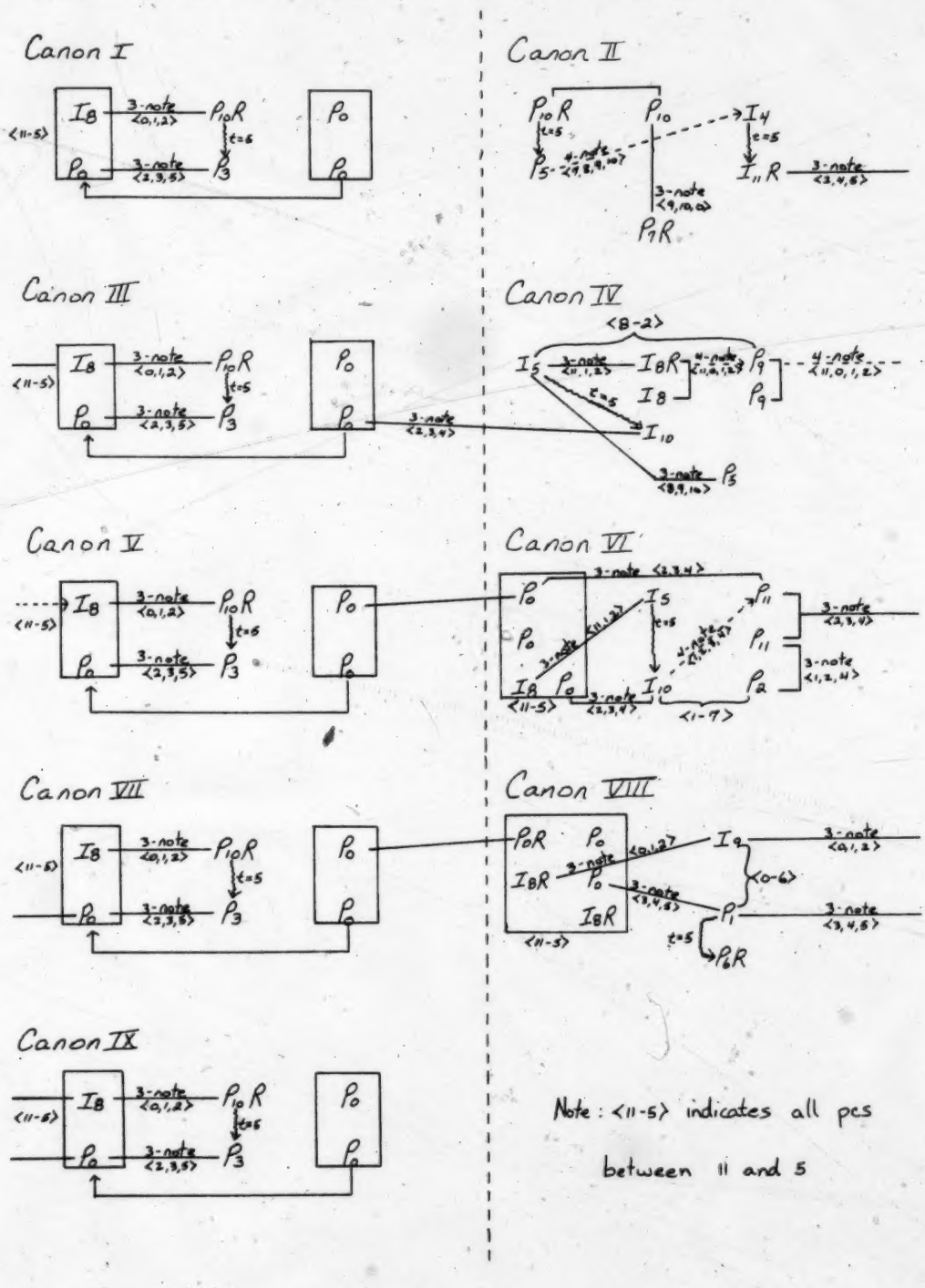
Throughout the canons, the treatment of the series is varied between the tenor line and the accompaniment. Firstly, the tenor line is wholly derived from the series, while nonserial material is

Example 1. Cantata, P. 14, MM. 1-8.

included in the accompaniment. Secondly, the tenor line repeats pitch and maintains melodic contour, while there are octave displacements and, hence, only pc repetition in the accompaniment. Thirdly, the number of rows utilized in each canon is consistent in the tenor line (three row statements in each canon) while it is variable in the instrumental lines. Each canon is twelve bars long in 4/8 time, except canons four and six which are nine bars in length. Throughout the canonic section the texture is consistent with the solo tenor and three instrumental lines (two oboes and 'cello).

The series stated within each canon are shown in Figure 2.6. Also shown are invariant segments both within and between canons and row pairs which produce chromatically-filled ic 6s. It is important to note that the odd-numbered canons are all identical. Each row is related in some respect to at least one other row. In the first canon there are only four different series, with P_0 being stated three times. The row pair used throughout the "cantus cancrizans" section (P_0 -I_8) occurs simultaneously to begin the first canon. This row pair produces the chromatically-filled tritone pcs 11 through 5. Each of these rows holds a three-note segment invariant with the next row pair ($P_{10}R$-P_3). The invariant segments are 0, 1, 2 and 2, 3, 5 and both are subsets of the initial tritone collection. The series of the second row pair are the same form of the row related by transposition at t=5, a feature which becomes prominent throughout the canonic section.

These techniques of adjoining series are all utilized throughout the even-numbered canons, with the addition of invariance of four-note segments and row pairs producing other chromatically-filled

Figure 2.6. Serial Statements in Canons of "Ricercar II"



tritones. A summary of these techniques and the canons in which they occur is given in Figure 2.7. Some summary statements may be

Figure 2.7. Techniques used and Canons where they are used

Use of row pair P_0 -I_8	I			VI	VIII
Use of transposed row pair			IV	VI	VIII
Use of identical (or R) rows	I	II	IV	VI	VIII
Invariance of three-note segment	I		IV	VI	VIII
Invariance of four-note segment		II	IV	VI	
Use of row forms at t=5	I	II	IV	VI	VIII

deduced from this chart. Only two techniques occur in all canons; the use of identical (or retrograde) rows in close proximity and the use of the same row forms at t=5. The use of either the row pair P_0 -I_8 or a transposed equivalent occurs in all canons except number II. Canons II, IV and VI contain invariance of four-note segments, while that of three-note segments occurs in every canon but number II.

As evidenced within the structure of the row itself, Stravinsky is concerned with the non-consecutive repetition of pc. Within all but one canon (number II) at least one row pair is present which forms a chromatically-filled tritone collection, and in each case the pcs from invariant segments are subsets of the tritone collections. Of note is Canon IV which contains one tritone collection (pcs 8 through 2) and three invariant segments (pcs 11, 1, 2; 11, 0, 1, 2 and 8, 9, 10). In addition, the total pc content of invariant segments is identical to the filled-in tritone. A similar technique is utilized in Canon VIII where the intersection of the two tritone collections (pcs 11 through 5, 0 through 6, intersection is pcs 0 through 5) is identical to the total pc content of invariant segments. It is also significant that the total pc content of segments held invariant

between canons is identical to the initial tritone collection (pcs 11 through 5). Within all canons, the pcs which are multiply represented within rows occur frequently on the larger level of invariance within each section.

Canon II is unique in its absence of a row pair producing a chromatically-filled tritone. The rows of Canon II are also unique in that they are the only ones which do not share invariant segments with the rows of Canon I. Canon II, then, can be thought of as isolated and somewhat distinct from the others. One possible reason for this is that the relationships found among its rows have either been introduced in Canon I or are making their first appearance. The relation of row forms related by t=5 (introduced in Canon I) is emphasized here with its twofold appearance. Invariance of four-note segments is first utilized in this canon. Although this canon appears to be unique among the collection, the techniques utilized within it become structurally important in later canons.

The logical progression throughout the canonic section is that Canons I and II introduce all the invariant possibilities between row pairs and these possibilities achieve greater significance through the remainder of the even-numbered canons. As has already been mentioned, the total pc content of invariant segments in Canon IV is identical to the pc content of the chromatically-filled tritone found there. Canons VI and VIII each contain two chromatically-filled tritone collections. The total pc content of invariant segments of Canon VI are a subset but not identical to the intersection of the tritone collections. In Canon VIII, however, the total pc content of invariant segments is identical

to that of the intersection of the tritone collections. Canon VIII is the logical culmination point of the increasing levels of invariance. It is interesting that, although the total chromatic is present within the serial statements of all other canons, it is not produced in Canon VIII. The serial statements, here, produce only eleven pcs with the final pc being present in the nonserial material.

The nonserial material and its relationship to the series, or serially-derived lines, has not been given much attention in the literature. For the most part, the nonserial material is in one of two forms, either sustained pcs or moving contrapuntal lines. The sustained pcs, found mainly in the "cantus cancrizans" and odd-numbered canons, largely support the centricity inherent in the simultaneous serial statements. Occasionally, the entries of sustained pcs are the same as the beginning of a row, but the statement is not continued. This form of nonserial material is not derived directly from the series but indirectly, from the strong centricity within the row. The second way of deriving nonserial material comes directly from the series, and is found mainly in the even-numbered canons. Order positions two through five of the prime row state a diatonic scale fragment and this is the basis for a large amount of the nonserial material. Within the nonserial material, however, the scale fragments are of variable length (two-, three- or four-note sets) and are presented in both ordered and unordered format. Often scale fragments are joined together into long chains of material.

The entire movement, except for the ritornelli, can be seen to derive either directly or indirectly from the series. The overall

form of the movement is a large binary; A being the "cantus cancrizans" section and B the canons.[7] Within these large divisions are eleven smaller binary pairs, each consisting of "cantus cancrizans" or canon plus ritornello[8], and an even slower refrain established by the recurring canon.[9]

The A section ("cantus cancrizans") establishes a row pair which shows a high level of invariance and a basis of pc content (chromatically-filled tritone pcs 11-5). The B section takes both of these characteristics as both its starting point and its refrain. The additional material builds the level of invariance between rows and culminates in the high degree of invariance displayed in the eighth canon.

NOTES

[1]Igor Stravinsky, "Program Notes," quoted in Eric W. White, Stravinsky: The Composer and His Works, 2nd ed. (Los Angeles: University of California Press, 1979), p. 469.

[2]Charles P. Wolternik, "Harmonic Structure and Organization in the Early Serial Works of Igor Stravinsky, 1952-57," (Ph.D dissertation, Stanford University, 1979), pp. 108-09.

[3]Ibid., pp. 109-110.

[4]Stravinsky, "Program Notes," pp. 470-71.

[5]Milton Babbitt, "Remarks on the Recent Stravinsky," Perspectives on Schoenberg and Stravinsky, revised ed. (New York: W.W. Norton and Co. Inc., 1972), p. 172.

[6]Wolternik, "Harmonic Structure," pp. 109-110.

[7]Ibid., p. 108.

[8]David Ward-Steinman, "Serial Techniques in the Recent Music of Igor Stravinsky," (D.M.A. dissertation, University of Illinois, 1961), p. 3.

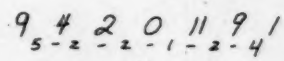
[9]Ibid., pp. 4-5.

CHAPTER 3: SEPTET

The Septet, completed in 1953, is scored for clarinet, horn, bassoon, violin, viola, 'cello and piano. The work is cast in three movements; the first in sonata-allegro form, the second is a Passacaglia and the last a Gigue.

The initial theme of the first movement is stated in the opening measure by clarinet (Figure 3.1). This statement is a three-part

Figure 3.1. Theme of First Movement

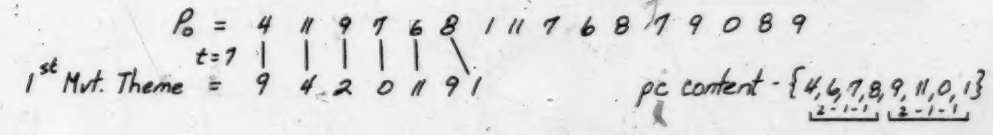


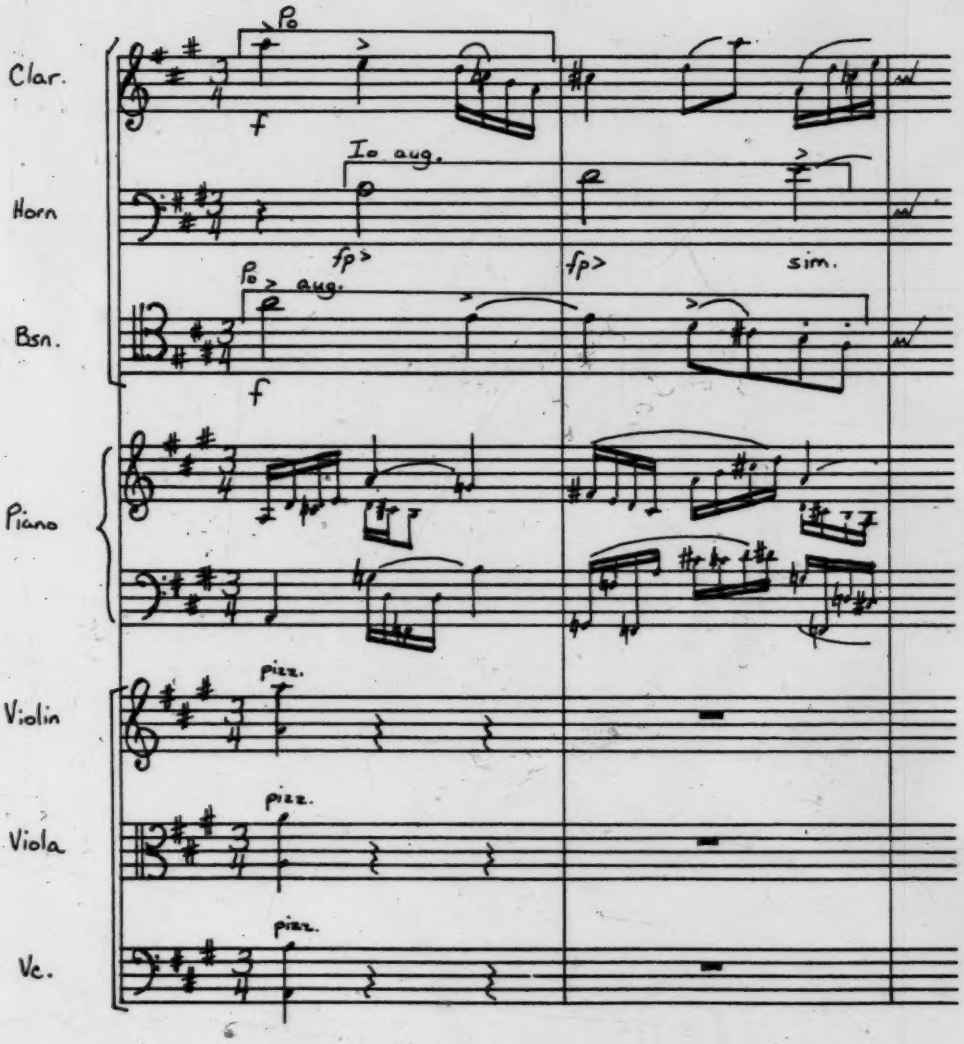
canon with augmentation in the bassoon and an inverted form in augmentation in the horn (see Example II). Certain characteristics

> --contrapuntal texture, extensive chromaticism, use of serial devices, and establishment of a clear polar centre--are present in the opening measures of the first movement. Although this portion of the movement is not serial, the opening clarinet melody provides the germ motive for the series used in the other two movements, and its future role is foreshadowed here by the freely canonic treatment it receives from the bassoon and horn.[1]

The first movement will not be considered in this study because of its nonserial structure. The Passacaglia and Gigue, which are both serially organized, will be discussed in detail. Each of these movements uses the same series (Figure ~~3.2~~). Although

Figure 3.2. Series of Passacaglia and Gigue



Example II. Septet, P. 1, MM. 1-2.

the first six notes of this series are a transposition (t=7) of the first movement's theme, as indicated in Figure 2.2, the series is extended to include sixteen elements, of which only eight pcs are unique. The row is similar to that of "Ricercar II" from the Cantata in that non-consecutive repetition of pc is included and the total chromatic is not present. The pc content of this series is similar to the major scale, each consisting of two identical tetrachords related by transposition. The tetrachords of the series are related by transposition at t=5, while those of the scale are related by the complementary interval, t=7. Consequently, maximal pc intersection between transpositionally related rows, in both instances, occurs at either t=5 or t=7. These transpositional levels are traditionally used in canonic structures and throughout both movements the serial material is used in a canonic style.[2]

> This motivation of traditional procedures by nontraditionally determined criteria is deeply Stravinskyian, in both the technical domain and the historical domain, wherein he presents himself for comparison with his great predecessors and announces his colleagueship with them, be they Baude Cordier, Isaac, the Schuetz of the God of two voices, Bach, or Schoenberg.[3]

Although no inversional row retains pc identity with the original, maximal pc intersection occurs between P_0 and I_0, which holds seven pcs invariant.

Within the basic series there is one ordered three-note segment which is repeated (pcs 7, 6, 8) and one unordered four-note segment restated (pcs 6, 8, 7, 9).

Passacaglia

This movement consists of a statement of the theme and nine variations. The theme is a statement of P_o which is divided among four instruments (see Example III). The theme recurs in each variation as a ground bass in the typical passacaglia rhythm. Throughout the restatements of the passacaglia theme, there are octave displacements which alter its contour. The theme, however, is easily discernible by its recurrent rhythm which occurs in all variations, except eight and nine. All material is serially derived, except the counterpoint in variations I, IV and VII. Throughout this movement the series is used linearly, although often one serial statement encompasses more than one timbre.

> The piano part offers the first case in which Stravinsky uses consecutive notes of the row simultaneously to form verticals [mm. 21 + 7- 22 + 3]--in spite of the contention of several commentators that the earliest such instance does not occur until the Canticum Sacrum.[4]

The number of row transpositions utilized in this movement is relatively small. Although each variation has several statements of the series, there are often repetitions of specific rows with varied rhythms. Figure 3.3 illustrates the number of rows stated in each variation, the number of different rows and the actual rows used in each variation. From this chart we see that only the theme and variation IX contain no serial duplicates. In all other variations the row P_o is stated multiply, either two, three or four times. In addition, variations II and III contain multiple statements of other series. If we compare the variations by how many row forms

Example 11f. Septet, P. 12, MM. 0-8.

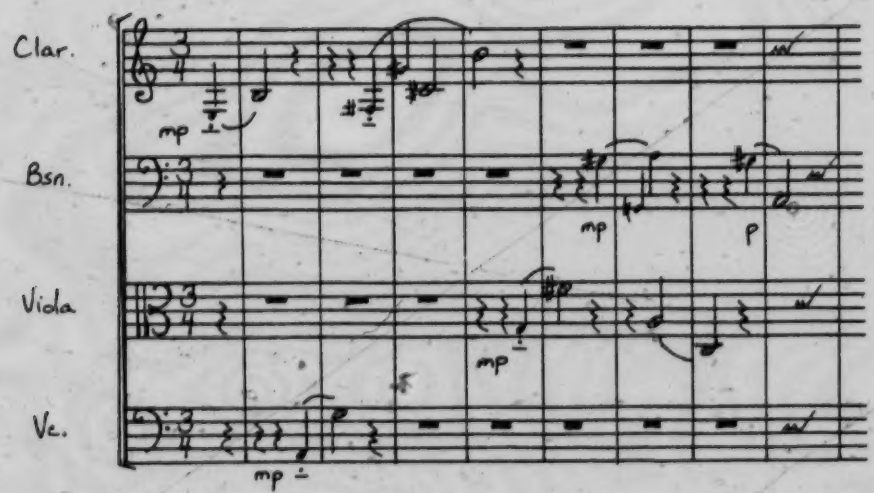
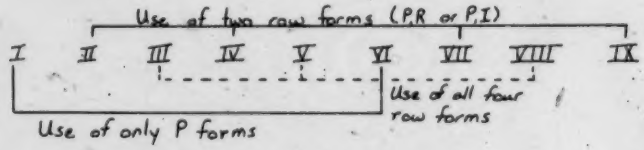



Figure 3.3. Series used in Passacaglia

Variation	Theme	I	II	III	IV	V	VI	VII	VIII	IX
Number of rows stated	1	2	7	11	3	5	2	4	7	2
Number of different rows	1	1	4	6	2	4	1	3	4	2
Rows used	P_0	P_0 (2x)	P_0 (3x) P_9 P_{10} (2x) P_3R	P_0 (3x) I_0 P_0R (3x) I_0R I_{10} $I_{10}R$ (2x)	P_0 (2x) I_1	P_0 (2x) P_0R I_0 I_0R	P_9 (2x)	P_0 (2x) I_1 P_3	P_0 (4x) P_0R I_0 I_0R	P_0 I_0R
Row forms used	P	P	PR	PRIRI	P.I	PRIRI	P	PI	PRIRI	PI

(P, R, I or RI) are used in each, we find a symmetrical structure (see Figure 3.4). Variation V acts as the axis of symmetry and the

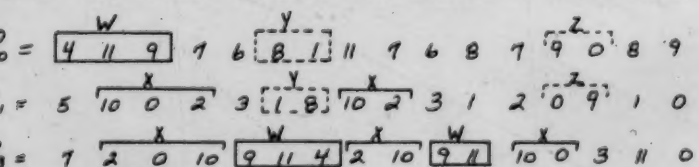
Figure 3.4. Comparison of Row Forms in Variations



pattern of row forms used in variations I through IV are repeated in variations VI through IX.

There are, however, more significant characteristics which structure this set of variations. Perhaps the most important of these characteristics is the use of nonserial counterpoint in three variations (I, IV and VII). The structure of the nonserial lines is similar in each of these variations and although the ic make-up of these lines is similar to that of the series, no direct connections between the two can be established. The serial statements of the three variations show an additive process. The first variation contains two rhythmically varied statements of P_0, the fourth variation adds one statement of I_1 to the previous material, while the seventh variation restates the fourth with the addition of P_3. The three series used in these variations all share some invariant elements and these are shown in Figure 3.5. From this example, we find that

Figure 3.5. Invariant Elements in Series of Variations I, IV and VII



in variation IV, where P_0 and I_1 are used, the only invariant elements are two two-note segments. These segments are retained in the same order positions, although the internal order of each is reversed. With the inclusion of P_3 in variation VII, the level of invariance is heightened. This row shares a three-note ordered segment (retrograde order) with each of the other rows and three different two-note segments with the other rows. Throughout this sequence of variations, the level of invariance progressively increases as each new series is added. Example IV shows variation VII and the invariant segments. It is significant that the invariant segments always occur in close proximity, that is, either simultaneously or consecutively. This procedure is consistent with Stravinsky's concern with nonconsecutive repetition of pc and pc segments, which has already been noted in the "Ricercar II" of the Cantata and the series of this work.

A comparable progression does not exist within the other variations, although certain similarities may be noted. Variations III, V and VIII are related by their inclusion of all four row forms. The third and fifth variations utilize two levels of transposition (t=0 and t=10), while variation VIII uses only one level of transposition (t=0). The texture of variations III and V is very similar, with several timbres participating in the serial statements, although statements occur simultaneously in the third variation and successively in the fifth. Variation VIII is characterized by several simultaneous linear serial statements, each occurring in one instrument. The three rows utilized in these variations and their invariant elements are shown in Figure 3.6. Invariant elements between P_0 and I_0 are

Example IV. Septet, P. 18 M. 6- P. 19 M. 2.

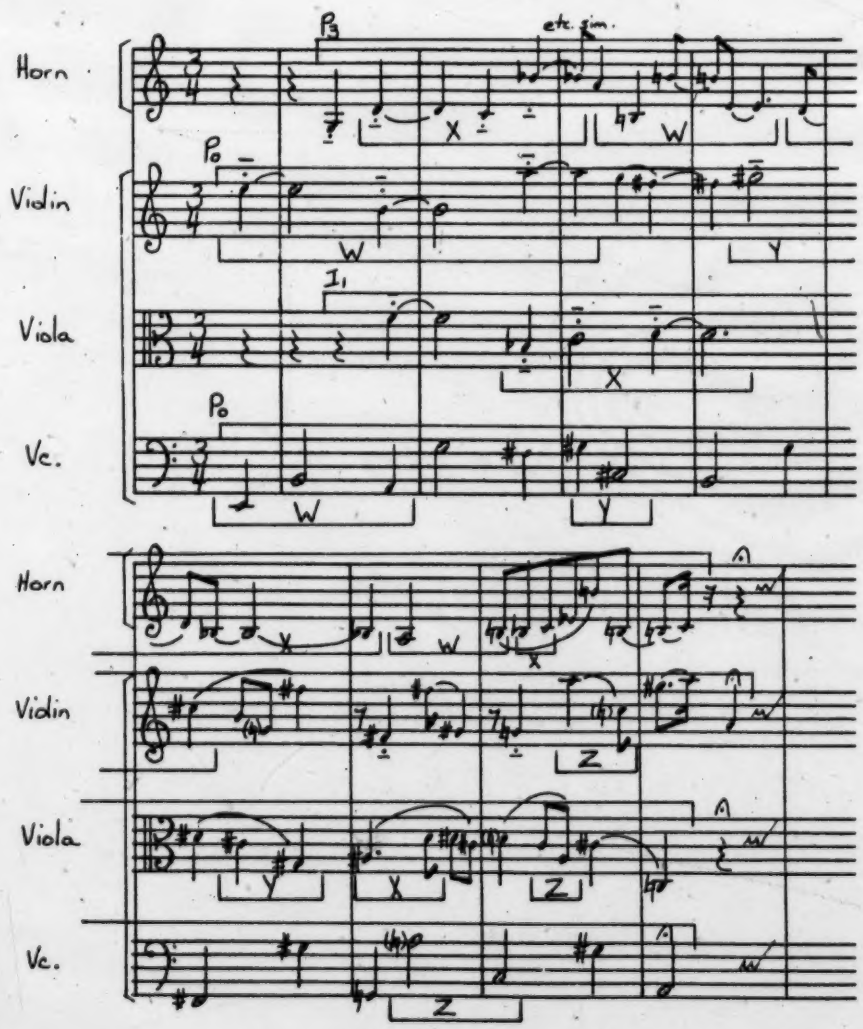
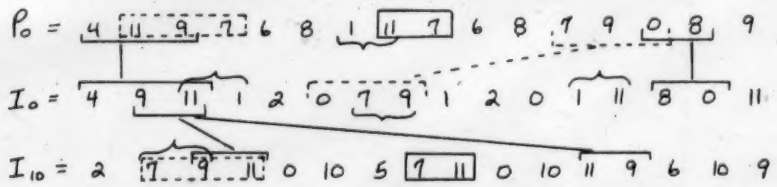



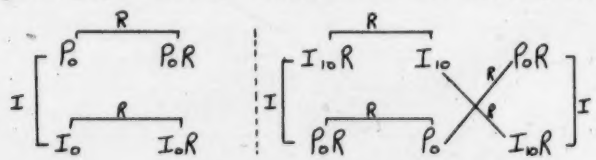
Figure 3.6. Series used in Variations III, V and VIII



numerous. Of particular note is the retention of the initial three-note segment. I_{10} shares fewer invariant elements with the other rows but of particular note is the retention of the central pc pair and the end elements between P_0 and I_{10}.

The serial statements of variation III are shown in Figure 3.7.

Figure 3.7. Serial Statements of Variation III

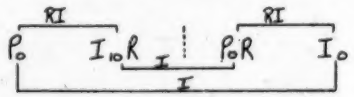


P_0 in passacaglia rhythm

Throughout this variation, three serial statements are sounded simultaneously, the passacaglia theme and two upper lines. The upper lines each consist of five serial statements which are divided into groups of two and three rows. Within these groupings the rows are related by untransposed retrograde motion, while between groupings the relation is untransposed inversion. Although this variation utilizes the most rows of any variation, a very logical and concise structure is present.

The serial statements of variation V are given in Figure 3.8. The rows stated are the same as in variation III, although different structures are formed. In this variation only two series are sounded

Figure 3.8. Serial Statements in Variation V



P_o in passacaglia rhythm

simultaneously. In the upper line, there are four serial statements which are divided into row pairs. The row pairs are related in two ways. Within each pair, the rows are related by untransposed inversion of the retrograde. The second relationship is between inner and outer pairs of rows, both of which are related by untransposed inversion and produce a symmetrical structure.

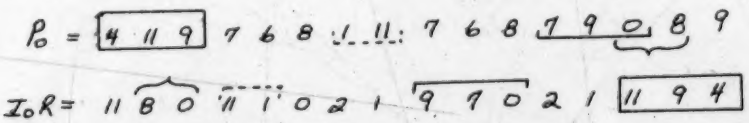
"The most complicated serial organization of the movement--and indeed, of the entire Septet--occurs in the eighth variation."[5] In this variation, there are seven simultaneous serial statements, each occurring linearly in one instrumental part. Rhythmically each part is varied and, for the first time in this movement, the original passacaglia rhythm is not used. This variation utilizes all four row forms at the original pitch level.

Throughout these three variations (III, V and VIII) the same rows are utilized, with a variety of interrelationships and structures produced. In variations III and V, two types of relationships are formed between rows of the upper lines. Because of the simultaneous sounding of rows in variation VIII, four types of relationships are formed between rows (P, R, I and RI). Rows used as counterpoint to other rows are significant in variation III and become the main structural characteristic of variation VIII. Variation VIII is also

the most complex section rhythmically, with its seven rhythms uniquely intertwined.

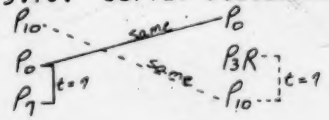
There are no clearly defined similarities in variations II, VI and IX. Variations VI and IX are related in that they both state two rows. Variation VI contains only two rhythmically varied statements of P_o and, thus, is the most simply constructed variation. Variation IX, however, utilizes two different series, P_o and I_oR. These statements are distinct instrumentally, with P_o occurring in the winds and I_oR in the strings. These two rows and their invariant elements are shown in Figure 3.9. The most significant invariant relationship is

Figure 3.9. Invariant Elements between P_o and I_oR



the retention of the three-note segment, pcs 4, 9, 11, at the beginning of P_o and at the end of I_oR, an invariance which suggests a retrograde relationship between the rows. This relationship is supported by the retrograde placement of the pc pair 8-0. In actuality, however, the relationship is that of retrograde inversion. Variation II introduces a structural technique which, although not used again in this movement, is utilized in the following Gigue. The technique used is the adjacency of rows which contain maximal pc intersection, that is rows related by transposition at t=5 or t=7. The serial statements of variation II are given in Figure 3.10. Above the ground bass, there are six serial statements divided into two entries. There are two rows, P_o and P_{10}, which are stated twice, once in each entry. One statement of each row

Figure 3.10. Serial Statements of Variation II

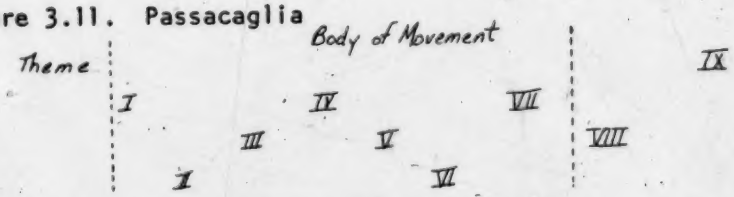


P_0 in passacaglia rhythm

is simultaneous with a row related by t=7.

Previously we noted a symmetrical structure based on the row forms utilized throughout this set of variations. After considering other structural characteristics, we can now make more comprehensive comments on structure. A schematization of the movement is presented in Figure 3.11. Similarities between variations occur on four levels.

Figure 3.11. Passacaglia



The first level is established by the theme and is balanced by the simplicity of row statements in the concluding variation (IX). The variations utilizing the passacaglia rhythm (I through VII) form the body of the movement and produce a symmetrical structure around the fourth variation. Variations I, IV and VII are similar in their use of nonserial counterpoint. Variations III and V are related by the use of the same rows and similar textural characteristics. Variations II and VI are similar only because each represents a unique structure within the movement. Variation VIII is not included in the symmetrical structure because of the absence of the passacaglia rhythm, but it does provide the climax of contrapuntal techniques within the movement,

before the simplicity of the final variation.

Gigue

The Gigue, the last movement of the Septet, uses the same row as the Passacaglia, although now in a new rhythmic guise.

> Here, rather than directing one to the serial unit through the bracket notation, Stravinsky indicated what he labelled the "row" associated with each instrumental line. But whereas the term "row" always signified, as a synonym of "set" or "series", an ordered collection of twelve pitch classes, thus removing one from the era of Isaac to a much more recent era, Stravinsky used the term to signify the unordered pitch class collection from which the serial unit is constructed, as in the Cantata, by ordering with non-successive repetition; . . .[6]
>
> Both Babbitt and Perle have remarked on the properties which the unordered set shared with the diatonic "major" scale: its construction from two identical tetrachords, and the fact that the transpositions with the greatest overlapping of pc content are those related by ic 5. This feature is compositionally exploited by the use of row forms related by ic 5 for fugal entries, thus--as in the first movement--establishing a relationship with traditional fugal practice. The polarities which are briefly established at the end of each of the four fugues, B and E, and the overall polarity of the work, A, are also related by ic 5. The opening entries on E and B indicate an E orientation at the beginning of the movement, although Stravinsky may have thought of the row, and therefore the movement, as being in A. The progression from E to A over the length of the "Gigue" parallels the course of the row itself.[7]

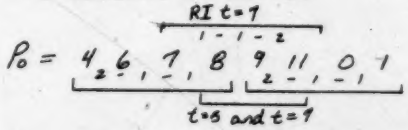
Serial material in this movement appears in two ways: as an ordered collection of sixteen elements and as unordered sets. The movement consists of four fugues arranged in pairs, the first of each pair is a single fugue and the second is a double fugue. The single fugues are scored for strings, while in the double fugues, the piano essentially repeats the preceding string fugue and the winds add a new fugue subject, based on the same series but with a new rhythm. The ordered series is used for fugal entries, after which unordered sets

are utilized.

The serial outline of the entire movement is shown in Figure 3.12. From this diagram, we can see that linearly in each fugue, all entries are related by transposition at t=5 or its complement, t=7. Within each fugue, there are six statements of the series, except fugue IV which contains seven serial statements because of the retrograde pairing of I_5 and I_5R. The first pair of fugues uses only prime row forms, while prime and inversional row forms, with one retrograde inversion, are used in the second pair of fugues.

As has been mentioned, rows related by t=5 or t=7 share maximal pc intersection. If we examine the pc content of the series (see Figure 3.13), we find two tetrachords which are identical under the operation

Figure 3.13. Pc Content of Series

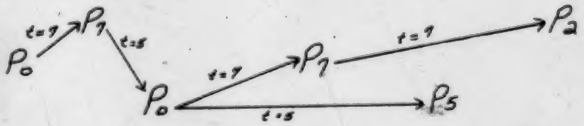


transposition at t=5 and t=7. Because of the ic 1 between tetrachords, an identical tetrachord is formed which is related by retrograde inversion at t=7 to the first tetrachord.

If we examine the fugues again with this point in mind, we find some additional structural characteristics. Within the first two fugues, only prime row forms are used and two row sequences become evident. Both sequences, extending from P_0, progress by transposition at t=5 or t=7 and include three row transformations (see Figure 3.14). In the row chain related by t=7, the first tetrachord of P_0 is identical to the second tetrachord of P_7 and likewise between P_7 and P_2. In the

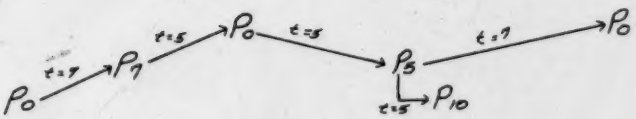
Figure 3.12. Serial Statements in Gigue

Fugue I

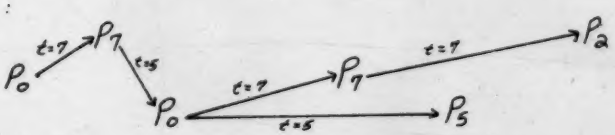


Fugue II

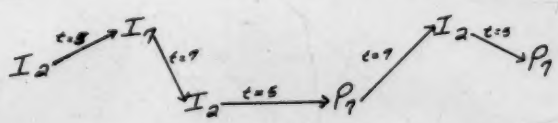
Winds:



Piano:

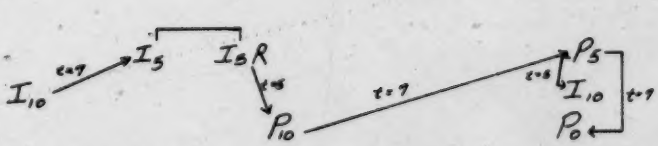


Fugue III



Fugue IV

Winds:



Piano:

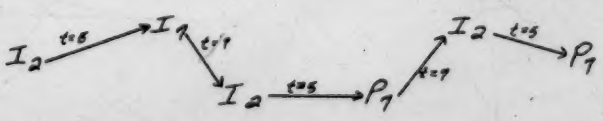
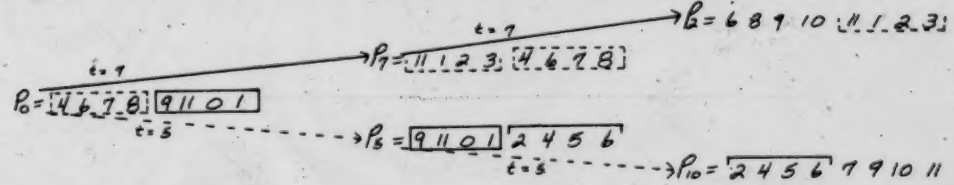


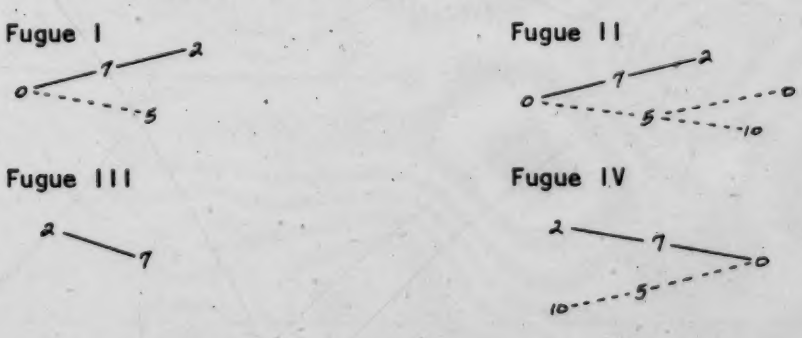
Figure 3.14. Invariant Tetrachords in Row Sequences



rows related by t=5, the second tetrachord of P_0 is equivalent to the first of P_5. Within the first fugue and the piano portion of the second fugue, all three rows from the t=7 chain are present (P_0, P_7, P_2) but only two rows from the t=5 chain are stated (P_0, P_5). So the t=7 chain is completed with three series and the t=5 chain is left incomplete, stating only two rows. In the double fugue, however, at the point where the t=5 chain ends in the piano, it is continued and completed in the wind fugue. Within this pair of fugues, both row chains are present, but the rows from the t=7 chain occur throughout while those of the t=5 chain are concentrated in the second half of each fugue.

The rows within the third and fourth fugues use the same transposition levels as the first pair, but now inverted and prime forms are utilized. Figure 3.15 shows the row chains within each fugue

Figure 3.15. Transposition Levels Throughout Fugues

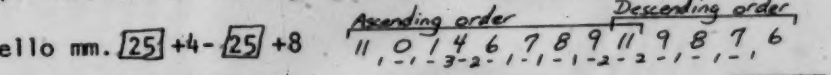


but only with regard to transposition levels. From this example, it is clear that the first pair of fugues presents the two row chains progressing away from P_0 and ending on the transposition levels of 2 and 10. The second pair of fugues begin on the transposition levels of 2 and 10 and retrace the steps back to P_0 in retrograde motion. Even with the inclusion of inverted row forms, there is an invariant tetrachord between adjacent rows, as indicated in Figure 3.16. The invariant segments in this section often encompass the four central elements (order positions three through six). Because of the addition of inverted row forms, both the structure and the progression of invariant segments become more complex. Even with the added complexity, Stravinsky succeeds in organizing the second pair of fugues in a retrograde version of the first.

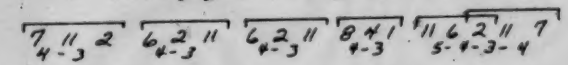
The presentation of the series as unordered pc sets follows each ordered presentation of the fugal entries. The material in these sections is arranged in two ways. The first method occurs as a result of stating the pc content of the series in ascending or descending order and is characterized by small ics (see Figure 3.17a).

Figure 3.17. Methods of Arranging Unordered Pc Material

a) 'cello mm. 25 +4- 25 +8 Ascending order / Descending order

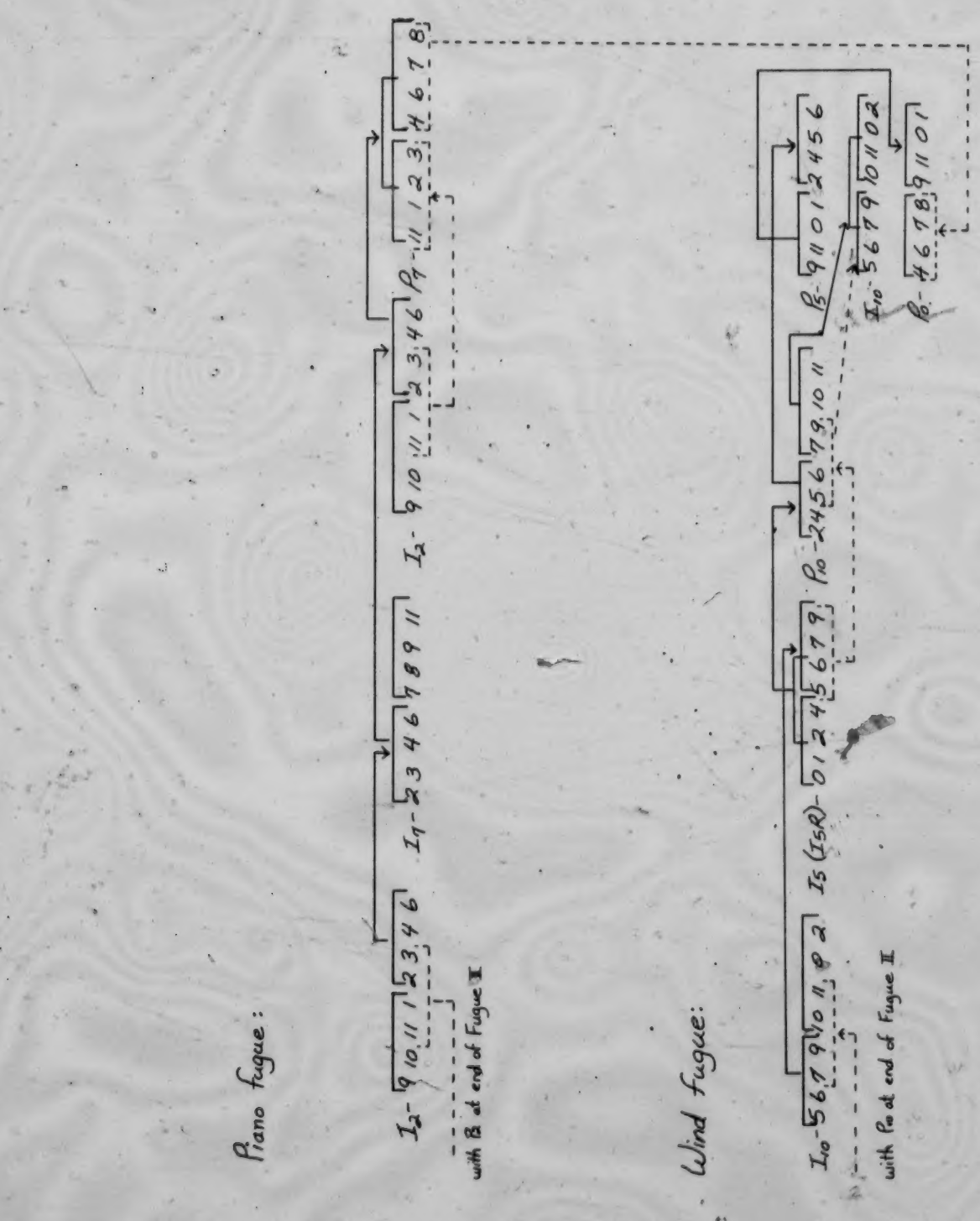


b) violin mm. 27 - 28



The second method of arranging unordered material concentrates on larger ics (particularly ics 3, 4 and 5) and appears as broken chord figures (see Figure 3.17b). These figures are generally within an

Figure 3.16. Invariant Segments in Fugue IV



octave and are heard as broken chords, whereas the scalar segments are aurally disguised by octave displacements. The unordered passages present the same pc sets as the series used for fugal entries in each voice.

Within the Passacaglia and Gigue, although the serial material is the same and both movements utilize retrograde motion, each movement arrives at this compositional technique from a different angle. Relationships formed within the Passacaglia involve, for the most part, whole rows, their relationship to each other and segments of the ordered row which remain invariant, while in the Gigue relationships are formed by transposition levels which retain maximal unordered pc content.

NOTES

[1]Wolternik, "Harmonic Structure," pp. 123-24.

[2]Ibid., pp. 138-39.

[3]Babbitt, "Recent Stravinsky," p. 173.

[4]Wolternik, "Harmonic Structure," p. 136.

[5]Ibid., p. 133.

[6]Babbitt, "Recent Stravinsky," p. 173.

[7]Wolternik, "Harmonic Structure," pp. 138-39.

CHAPTER 4: THREE SONGS FROM WILLIAM SHAKESPEARE

The Three Songs are scored for voice, flute, clarinet and viola. The first song, "Musick to heare", is a setting of Shakespeare's VIIIth sonnet. Throughout this song almost all the material is derived from one series and, except for the concluding measures (44-50), it "is a two-part composition, one part vocal, one part performed on a monophonic instrument with varying timbral characteristics."[1]

The series, initially stated by the flute, is a four-note unit characterized by small ics, no pc repetition and a span of ic 4, as shown in Figure 4.1. This is Stravinsky's first use of a series

Figure 4.1. Series of "Musick to heare"

$P_0 = 11_4\ 7_{-2}\ 9_{-1}\ 10$ $\quad\quad$ $\langle 2,2,1,1,0,0\rangle$

which contains no pc repetition.

The form of the poem dictates the musical structure. The sonnet is divided into three quatrains and a couplet. Each major poetic division defines a musical division and there is also an eight-bar instrumental introduction.

In the introduction, the flute states six forms of the row: P_0, I_9, P_0, I_0, P_3, I_0 (see Example V). This sequence is divisible into two groups. Each group consists of three rows, of which two are the same. The arrangement of these rows indicates a three-row group followed by its inversion, although this relationship is not supported

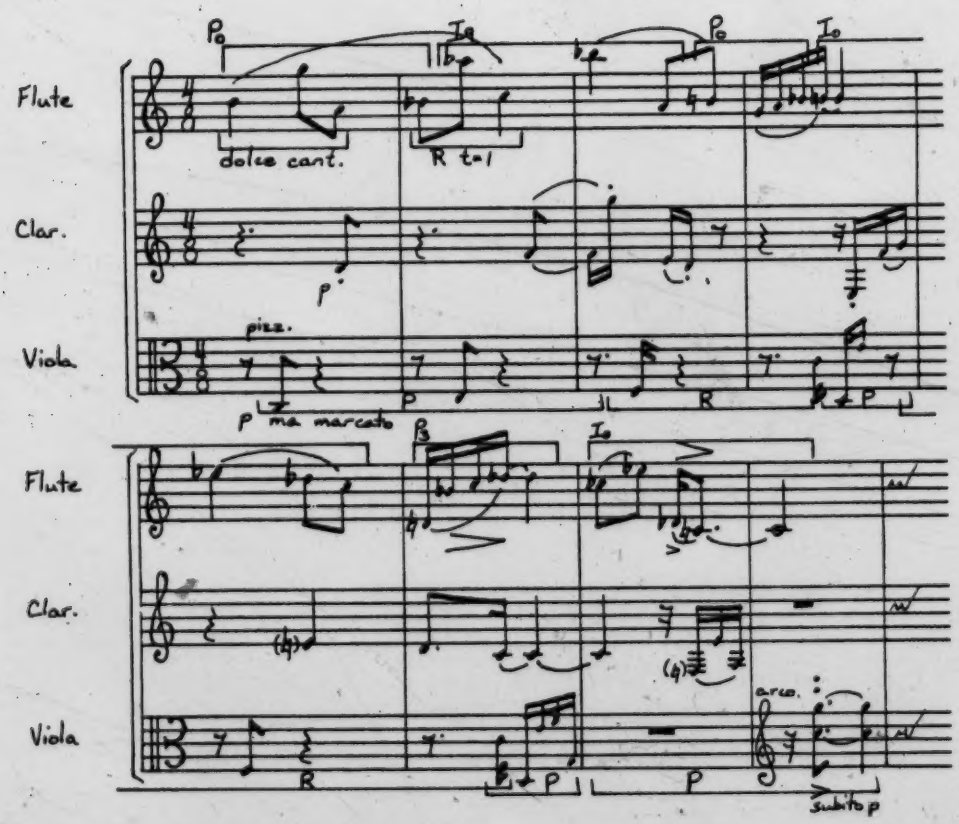
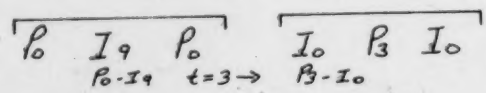
Example V. Three Songs from William Shakespeare, P. 3, MM. 1-8.

by the rhythmic or registral placement of the notes. More importantly, the two groups are related by transposition at t=3, a relationship which figures prominently throughout the song (see Figure 4.2). These

Figure 4.2. Relationship between Six Series Sequence



rows are never repeated in the instrumental parts, but they do provide the majority of material utilized in the vocal line. The instrumental lines state transpositions of the three-row group, often eliminating the repeated row.

> The first statement of the [four-note] unit is followed by an inversion at a transposition level selected so that a hexachord is formed, and, incidently, phrase articulated, by the first four notes of the serial unit and the first two notes of the inversion, which contain no pitch repetition, and chromatically fills the fourth, G-C. Its structure can further be described as deriving from the first three notes of the unit by applying the operation of retrogression; this application of such an operation to, above all, a three-note segment is characteristically Webernian.[2]

The procedure of retrogression is further emphasized by the rhythmic and registral placement of these initial six notes. The relation between three-note subsets is retrogression followed by transposition at t=1. Although the first six notes of the second row group (I_0 -P_3 -I_0) have the same possibilities for retrograde placement as those from the initial group, these possibilities are not realized in the case of register or rhythm.

The accompaniment to the introduction consists of a repeated five-note unit stated by clarinet and viola. For the most part,

the repetitions alternate between prime and retrograde forms. "Stravinsky's use of the diatonically filled fifth C-G, presumably to emphasize the tonality, is interesting because of the frequent octave displacements, which unite it with the rest of the piece but also serve to disguise aurally its basically simple origin."[3] This diatonic scale fragment is not related to the series but to the row pair P_0-I_9. The row pair produces all the chromatic pcs between G and C and the scale fragment produces all the diatonic pcs between C and G. The two sets are complementary. The use of these complementary sets give a sense of a C centre throughout the introduction.

Although simultaneities resembling tonal structures are rare, the introduction ends on a sustained 5 dyad. The dyad is formed by the only pcs shared by the melody and accompaniment (pcs 0 and 7) and strengthens the centricity of C.

The structure of the song is based entirely on characteristics noted in the introduction: retrogression, complementation, extended serial units (involving two or three rows) and transposition at two levels (t=1 and t=3).

The most consistent structural technique throughout the song is the use of row groups related by transposition at t=3. These row groups are shown in Figure 4.3. There are four row groups utilized (P_0-I_9, P_3-I_0, P_4-I_3 and P_7-I_4) which divide the octave in equal parts. These row groups are almost continuous throughout the song, being omitted only in the middle of the second quatrain (mm. 27-29). The statement of row groups produces a retrograde structure, with the row groups entering in ascending order in the first half of the song

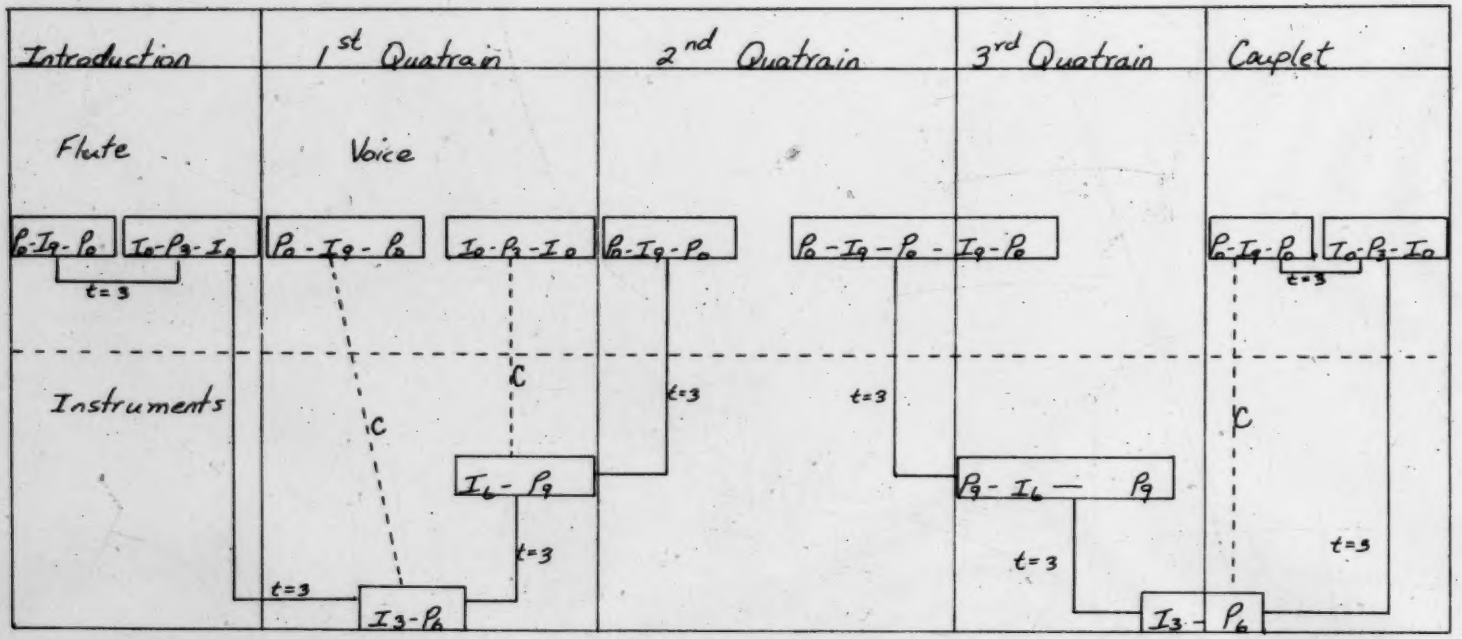
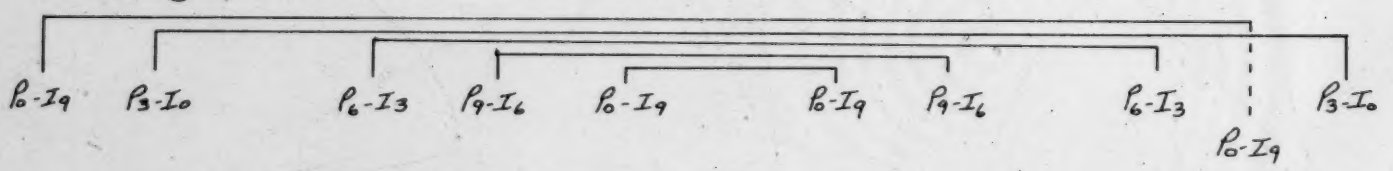


Figure 4.3. Row Groups related by t=3

Retrograde Structure

Order of row groups



(P_0, P_3, P_4, P_9, P_0) and reversing this order in the second half. The technique of complementation is also of significance with these row groups. Complementary sets are related by t=6 and produce the total chromatic. Of four instances where row groups are sounded simultaneously, three utilize complementary sets.

Row groups related by t=3 produce the structural framework of this song. Situated around this framework are row groups related to it by t=1. Selected rows from the t=3 sequence and those related by t=1 are shown in Figure 4.4. Of particular interest are the two row groups P_4-I_1-P_4 and P_8-I_5-P_8 which are related by t=1, and placed adjacent to P_3-I_0 and P_9-I_4 respectively. These two row groups divide the octave by ic 4s, as the structural frame of the song divided the octave by ic 3s. These row groups are the only ones with three serial statements, other than the original two row groups. The other row groups, P_{10}-I_7 and P_7R-I_4R, are both spatially divided and are also related to groups from the structural framework by t=1.

All instrumental rows are organized in row groups and related to each other by either t=3 or t=1. There are, however, two places in the vocal line where rows are not organized into row groups. In both cases, relationships utilized previously between row groups structure the material, but now on the level of individual rows (see Figure 4.5).

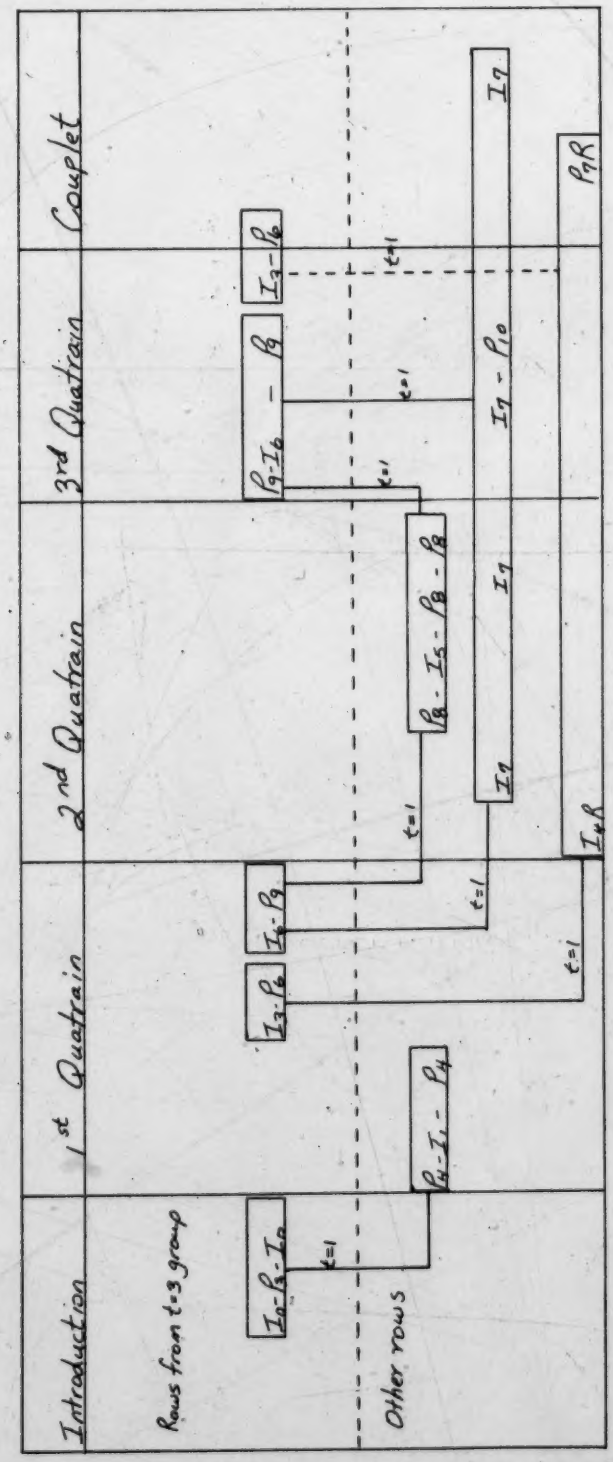
Figure 4.5. Vocal Rows not Associated with Row Groups

a) mm. 26-29 $\overset{t=1}{P_2} \quad \overset{t=1}{P_1} \quad P_0$

b) mm. 40-43 $\overset{t=3}{I_{11} \quad I_2}$

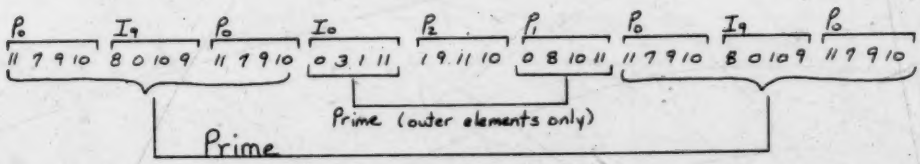
There is one case of serial reordering within this movement

Figure 4.4. Row Groups related by t=1



which involves I_0. The order presented is I_0 4-2-3-1 (or I_0R 1-3-2-4) and it occurs almost exactly at the midpoint of the movement. At first, this oddity appears to be an example of text-painting, but if the entire vocal line of the second quatrain is examined certain characteristics become evident, as illustrated in Figure 4.6. A symmetrical

Figure 4.6. Vocal Line of Second Quatrain



structure is formed with P_2 as the focal point. The structure is based on retrograde motion, but each unit of the retrogression is repeated in prime form. This procedure is reminiscent of Webern (particularly the second movement of his Symphony Op. 21). From Figure 4.6, we find that the three initial and three final rows are exact repetitions, but for the row pair I_0-P_1 only the outer elements adhere to this principle. The reordering of I_0 is imperative to maintain the retrograde placement of prime units.

The concluding couplet (mm. 44-50) is similar to the introduction in a number of ways. The initial six-row sequence appears in the voice as it did in the introductory flute part. The diatonic scale fragment also recurs, again in alternating prime and retrograde forms. For the first time since the introduction, retrograde registral placement of the first six notes from P_0-I_9 occurs. The only variation between the two sections is the addition of four serial statements in the flute part of the couplet. These additions complete both the descending pattern of row groups related by t=3 and both of the

spatially separated row groups. The relation between the introduction and the couplet is a restatement in prime form with additional material.

In conclusion, the structure of the introduction was based on retrogression, complementation, extended serial units, symmetrical placement of prime units and transposition at t=1 and t=3 (summarized in Figure 4.7). These relationships are all significant in the structure of the entire song (see Figure 4.8). Symmetrical structure is utilized with both retrograde and prime placement of units. It has been noted that row groups related by t=3 form the structural framework of this movement and produce a large scale retrograde structure. In the middle of the second stanza (also the centre of the movement) the structural framework is suspended in favor of the symmetrical placement of prime units in the vocal line. This structure grows to encompass the whole movement, with the symmetrical placement of the introduction and concluding couplet, which are in prime form (although there is additional material in the couplet). The structure of the movement is symmetrical but there is a consistent flux between prime and retrograde placement; features which are inherent in the initial row group and the first six notes respectively.

The second song, "Full fadom five", is based on a different series than the first song (see Figure 4.9). The pc content of this

Figure 4.9. Series of "Full fadom five"

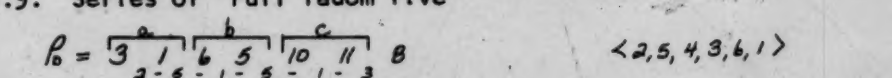


Figure 4.7. Structure of Introduction

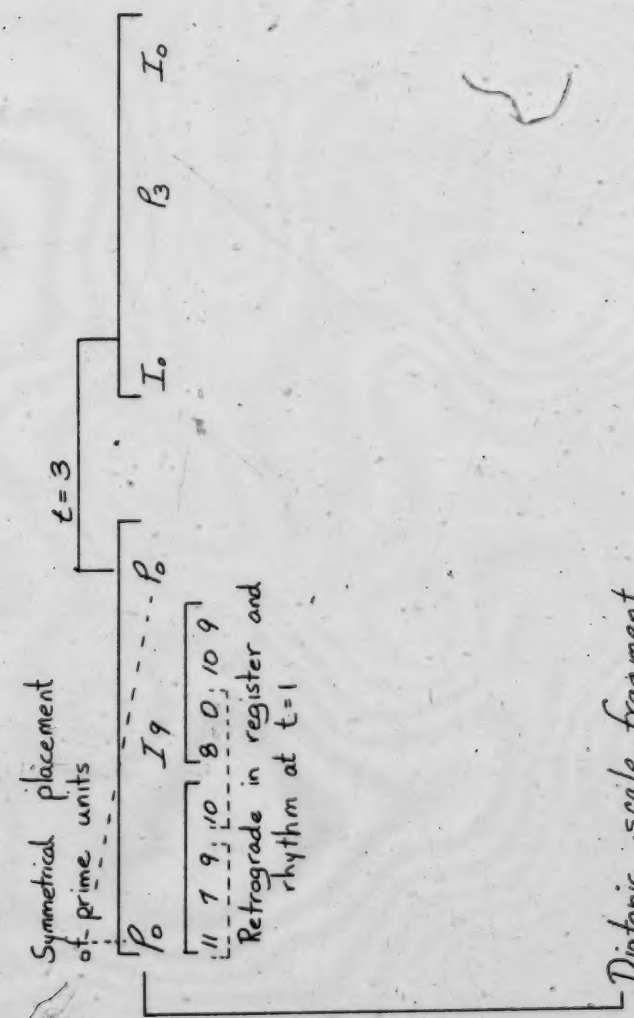
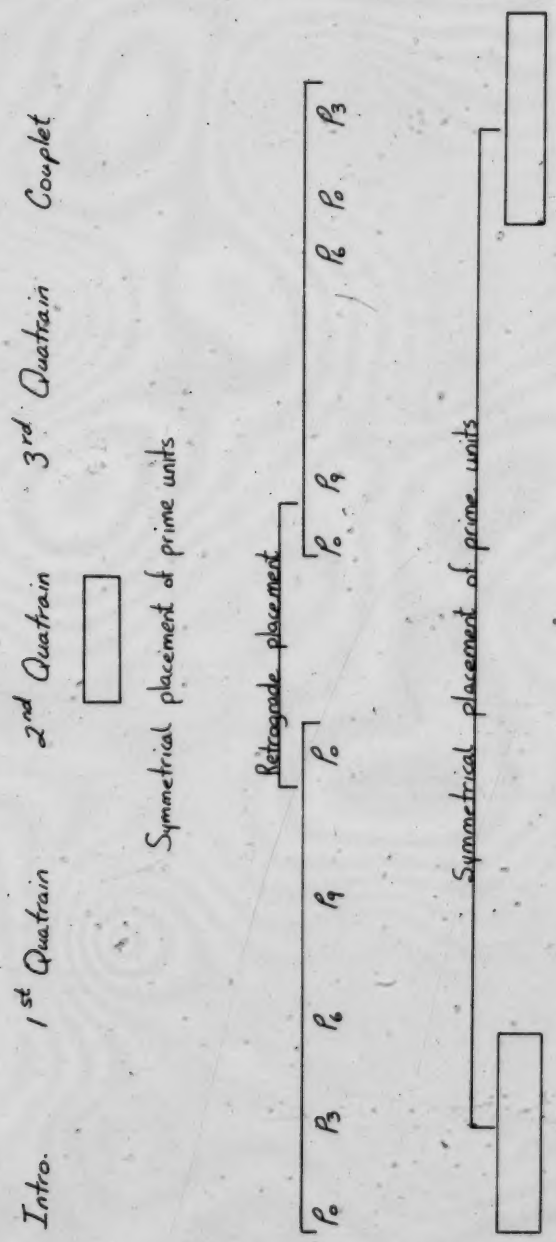


Figure 4.8. Structure of "Musick to heare"



series is identical to a major scale ($G^{\flat}$) and, therefore, maximal invariance is achieved at t=5 or t=7 (six pcs in common). One inversional row, I_{10}, retains the same pc content, as shown in Figure 4.10.

Figure 4.10. Invariant Row from "Full Fadom Five"

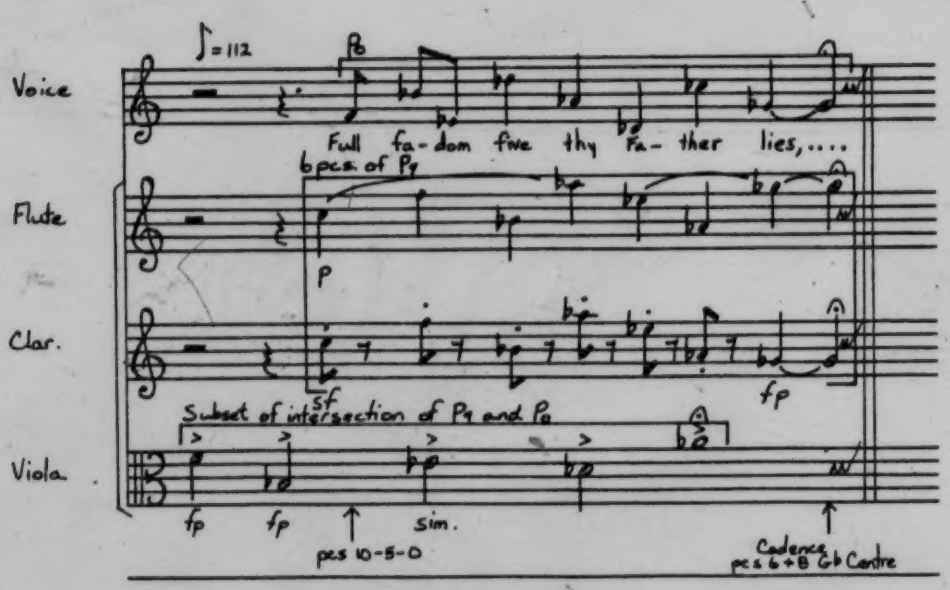
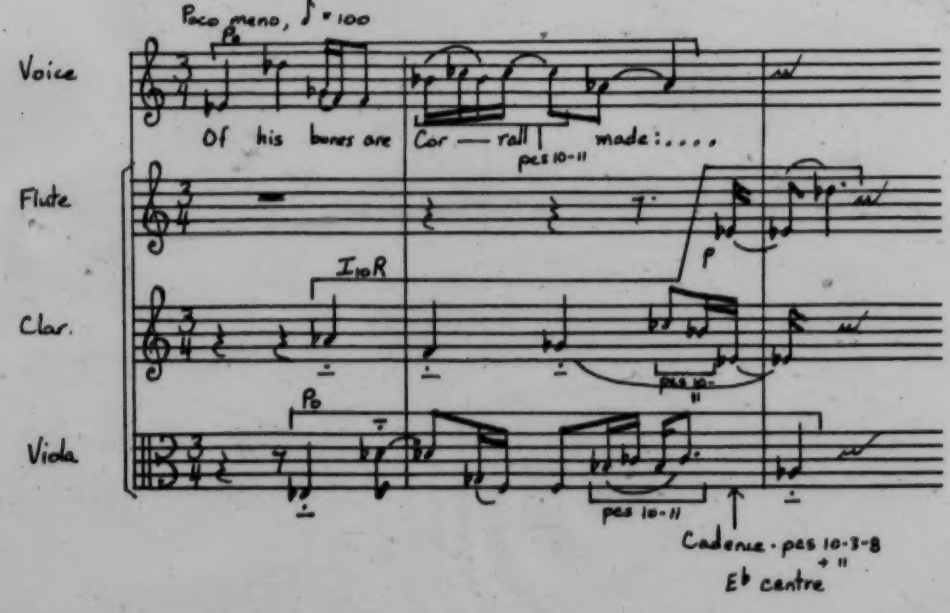
$$\underset{(R_0 I)}{I_{10}R} = 8\ \overbrace{5\ 6}^{b}\ \overbrace{11\ 10}^{c}\ \overbrace{3\ 1}^{a}$$

This row also retains linear dyads from the original, although now they are reordered. $I_{10}R$ is very similar to the retrograde of the prime, with the same framing elements pc 8 and dyad a, although the elements of dyad a are in reverse order, and the appearance of dyads b and c are also reversed.

This song is much freer than the first. The introduction (m. 1) presents the series in another order and the entry of the usual order is delayed until measure 2. In the concluding measures (mm. 16-22), the serial order is almost totally abandoned. There is also the addition of nonserial material within the body of the song.[4]

Example VI is the introduction, which utilizes a different order of the series. The elements of the original series are presented in the order 4, 5, 1, 2, 7, 2, 6, 3. There are three serial statements presented in diminution and double diminution. Wolternik states that the introduction

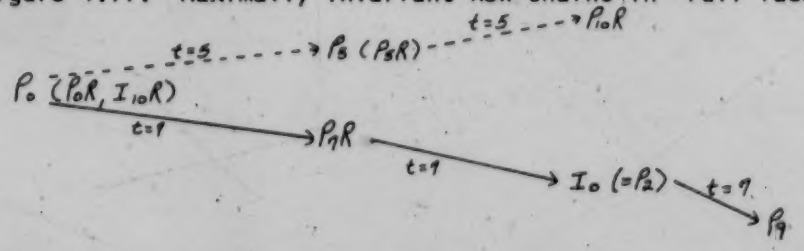
> foreshadows the tolling of bells in the last line of the poem, partly through the sforzando articulation of the clarinet and viola parts, partly through the canonic part-writing--in which the parts proceed at different rates of speed after the fashion of a peal of bells--and perhaps most cogently through the exclusive use of structures based on ic 2 and ic 5.[5]

Example VI. Three Songs from William Shakespeare, P. 6, M.1.

Example VII. Three Songs from William Shakespeare, P. 6, MM. 2-3.

The first simultaneity consists of pcs 10, 0 and 5, two simultaneous ic 5s (0-5, 5-10) or an ic 5 with an added ic 2 (5-10 + 0). This sonority recurs throughout the song, both vertically and horizontally. Horizontally this structure is evident throughout the introduction (voice 5-10-3 and 3-1-8, flute and clarinet 0-5-10 and 10-8-3). The final sonority of the introduction is similar (three pc 6s and a single pc 8), although only ic 2 remains and no ic 5 is stated. This cadence centres on G♭, the key to which all pcs from the original series belong.

The choice of rows throughout the introduction also shows an interesting relationship. The voice states all pcs from P_0, while the flute and clarinet state six pcs from P_7. These are maximally invariant rows which share six common pcs. Of this six-element intersection, five notes are stated in the viola.

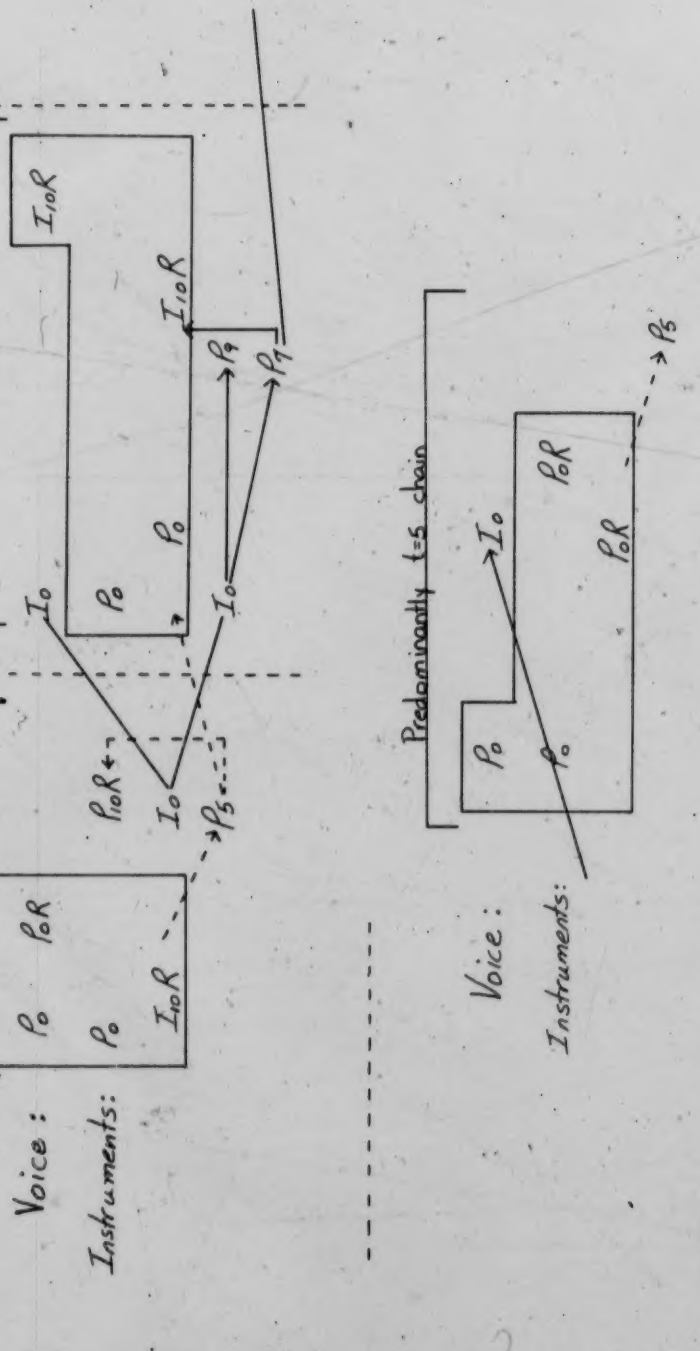
Throughout this song rows related by maximal invariance are structurally significant. There are two chains of maximally invariant rows both originating with P_0, as shown in Figure 4.11. The chain

Figure 4.11. Maximally Invariant Row Chains in "Full fadom five"



related by t=7 is extended to include one more row than the t=5 chain. Figure 4.12 illustrates the use of maximally invariant chains throughout the body of the song (mm. 2-16). Within each of the three sections, there are four row statements which share the same pc content

Figure 4.12. Invariant Chains Throughout "Full fadom five"



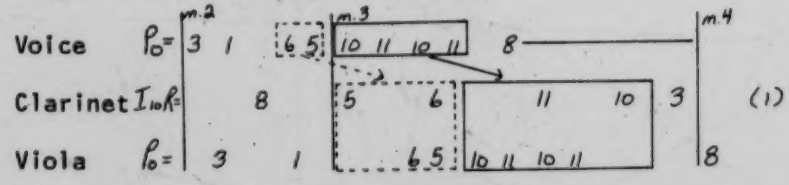
as P_0 (rows within boxes in Figure 4.12) and around these are rows from the chains of invariance. The rows in the outer sections are predominantly from the t=5 chain, while only rows from the t=7 chain appear in the central section. The introduction utilizes only rows from the t=7 chain, as does the conclusion (although in a much freer serial context). Throughout the song, then, we find sections employing maximally invariant rows, which alternate between the use of the t=7 and t=5 chains.

Example VII shows the initial measures of the body of the song (mm. 2-3), where the normal serial order is first used. Some characteristics from these measures shape the remainder of the movement. In this section three series are stated, P_0 twice and $I_{10}R$ once. Pitch is maintained (although the entire viola line is an octave lower) and, hence, contour is preserved. This feature continues throughout the body of the song with only two exceptions.[6] The canonic writing of the introduction continues here with the viola line following the voice after a dotted quarter. The rhythm of the vocal line is maintained throughout the song in the voice, although generally there are slight adjustments made towards the end of most statements. One instrumental part continues rhythmic imitation of the voice, following at a variety of time values, until measure 10, where the viola precedes the voice by one beat and concludes the rhythmic imitation.

The exclusive use of the invariant rows, P_0 and $I_{10}R$, in these opening measures clarify their relationship. In particular, the internal dyadic similarities are emphasized. The dyad consisting of pcs 10-11 is repeated in two of the three statements. Further,

the rhythmic placement of pcs is such that two dyads, pcs 6-5 and 10-11, occur simultaneously in the instrumental parts and immediately follow each dyad of the vocal line (see Figure 4.13). Dyadic repetition

Figure 4.13. Invariant Dyads in mm. 2-3



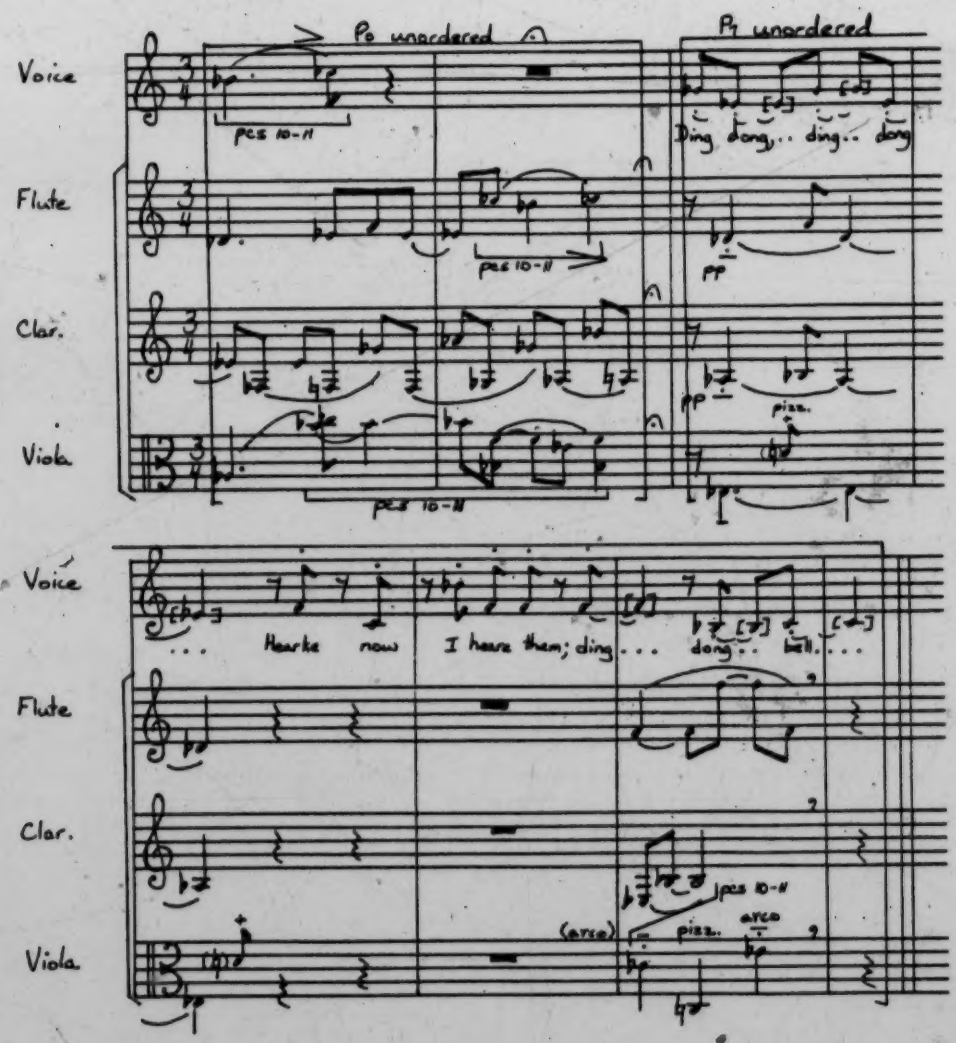
continues throughout the song and by far the most frequently repeated dyad is pcs 10-11. For the most part, repeated dyads form ic 1.

The cadence at the end of measure 3 indicates an E♭ centre, with the clarinet moving from pc 10 to 3 and the addition of pc 8 in the voice, which produces the vertical sonority found throughout the introduction. The inclusion of pc 11 in the viola adds a new ic to the sonority (ic 1). This interval, which achieved linear prominence in the repeated dyad, now gains vertical significance.

As Wolternik notes:

> The exclusive use of P and IR in the first two measures of the body of the song helps to establish the polarity of E♭, using the "Aeolian" scale. The previous cadence on G♭ is heard as the "relative major" of the E♭ centre. These two areas continue to control the harmonic movement of the song, which is strongly guided by traditional models. After the initial orientation toward E♭, the succeeding cadences create a well-defined progression to A♭, the "subdominant" (m. 1 +4); then to D♭, the "dominant" of G♭, with a "deceptive" resolution to E♭ (mm. 2 +4-3); and finally to B♭, the "dominant" of E♭, which leads to a reconfirmation of the E♭ centre (mm. 3 +5- 4). . . Typically, all of the secondary polarities are summarized in this concluding cadence, which includes the pcs E♭, A♭, D♭ and G♭ in the chord of resolution (m. 4).[7]

The concluding measures (mm. 16-22, see Example VIII) are serially much freer than the previous material. Two rows are stated succes-

Example VIII. Three Songs from William Shakespeare, P. 7, MM. 8-12.

sively, P_0 and P_7, although each includes 'foreign' pcs, pcs 4 and 9 in P_0 and pcs 2 and 11 in P_7. The vertical structures in this section are similar to those throughout the movement, that is predominantly ic 2 and ic 5 structures. Often added to these structures are ic 1s, derived from the repeated dyads sounded throughout the body of the song. Particularly in measures 16 and 17, the predominant dyad of the movement, pcs 10-11, is emphasized by constant repetition. The last two measures contain the same sonorities as the initial structures of the introduction, and effectively close the movement with an $E\flat$ centre.

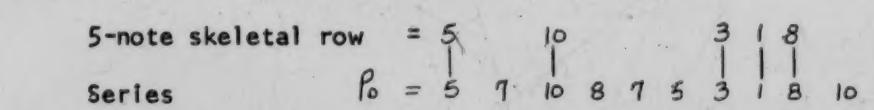
Certain characteristics from the introduction and the initial measures of the body of the song shape the remainder of the movement. The predominant characteristics are the vertical sonorities, two pitch centres ($G\flat$ and $E\flat$), canonic and imitative structures, the use of maximally invariant rows and the consistent recurrence of the dyad consisting of pcs 10-11. The concluding measures centre on $E\flat$ and the vertical sonorities sum up the temporary centres of the song. The recurrent dyad is emphasized throughout these measures and the ic 1 from this dyad becomes a prominent vertical structure. The conclusion, then, sums up the movement, emphasizing the main structural characteristics and reaffirming $E\flat$ as the main centre.

The third song, "When Dasies pied", is the most free of the three songs. The series appears only within the vocal part (although not always there) and never in the instrumental lines.

> The basic series of this song is found in the first measure of the vocal part, overlapping one note into the next measure. It will be readily seen that these ten notes are formed by simply filling in diatonically some of the intervals between the first

> five notes of the introductory bell motive from the previous song. . . . Subsequent entries reduce these ten notes to seven or expand them to as many as seventeen, but in all cases these are still derived from the skeletal five-note bell echo.[8] [See Figure 4.14].

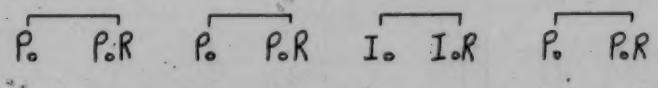
Figure 4.14. Series from "When Dasies pied"



This song contains two stanzas, which are set to the same music (mm. 24-48 are an exact repetition of mm. 0-24), plus a coda. The last nine measures of each section and the coda do not contain serially-derived material.

The serially-derived material occurs only in the vocal line of the first fifteen measures of each section. The serial structure of this song is the least complex of any of Stravinsky's serial works. Although all four forms of the series are present, they are never transposed. Because of the variety within the serial statements, it is necessary to identify them and this has been done in Figure 4.15. Each serial section contains only eight serial statements, as shown in Figure 4.16. As indicated by the brackets, the rows are arranged

Figure 4.16. Serial Structure of Vocal Line in "When Dasies pied"



in pairs, with the first of each pair being either a prime or an inversion while the second is the respective retrograde. Further evidence of pairing is the second row pair--P_0-P_0R--which utilizes only

Figure 4.15. Rows used in "When Dasies pied"

Five-note Skeletal Rows

P_0-5 10 3 1 8

P_0R-8 1 3 10 5

I_0-5 0 7 9 2

I_0R-2 9 7 0 5

Row	Measures	Pcs (x indicates pcs from skeletal row)
P_0	1-2, 10-12, 25-26, 34-36	x x x x x 5 7 10 8 7 5 3 1 8 10
P_0	4-5, 28-29	x x x x x 5 7 10 3 1 8 10
P_0R	2-4, 26-28	x x x x 10 8 1 3 8 1 3 5 7 8 10 0 10 8 7 5
P_0R	5-6, 29-30	x x x x x 10 8 1 3 10 7 5
P_0R	12-15, 36-39	x x x x 10 0 8 1 3 8 1 3 5 7 8 10 8 1 3 10 7 5
I_0	6-8, 30-32	x x x x x 5 4 0 7 9 7 5 4 2 0
I_0R	8-10, 32-34	x x x x x 0 2 9 7 0 7 9 2 0 2 4 5 7 9 7 5

seven elements each and retrograded pitch order.

The accompanimental lines to these sections (mm. 0-15 and 24-39) are not serially derived but are closely related to the vocal series. Each instrumental line is repetitive and where changes occur they coincide with the beginning of a new series in the voice. The viola carries the line most clearly connected to the serial statements. Except for the first note, this line states, in harmonics, the first three notes of each serial statement; pcs 5, 10 and 3 for P_o or P_oR and pcs 5, 0 and 7 for I_o or I_oR. Predominantly the flute and clarinet each repeat a dyad which produces an ic 1, while in combination the parts produce ic 5. In each dyad one pc is found in the serial material and the other is not. The inclusion of nonserial pcs recalls the use of ic 1 in the second song, both horizontally (in the series proper) and vertically (as a chordal element). It is interesting that the nonserial pcs, 2 and 9 for P_o and 8 and 1 for I_o, are, in both cases, the last pc pair of the other five-note skeletal row. There are two exceptions to the repetitions of dyads within these lines, the first measure (where all notes of the skeletal row are present in the instrumental parts) and measures 32-34 (where pcs from P_o are anticipated in the accompaniment).

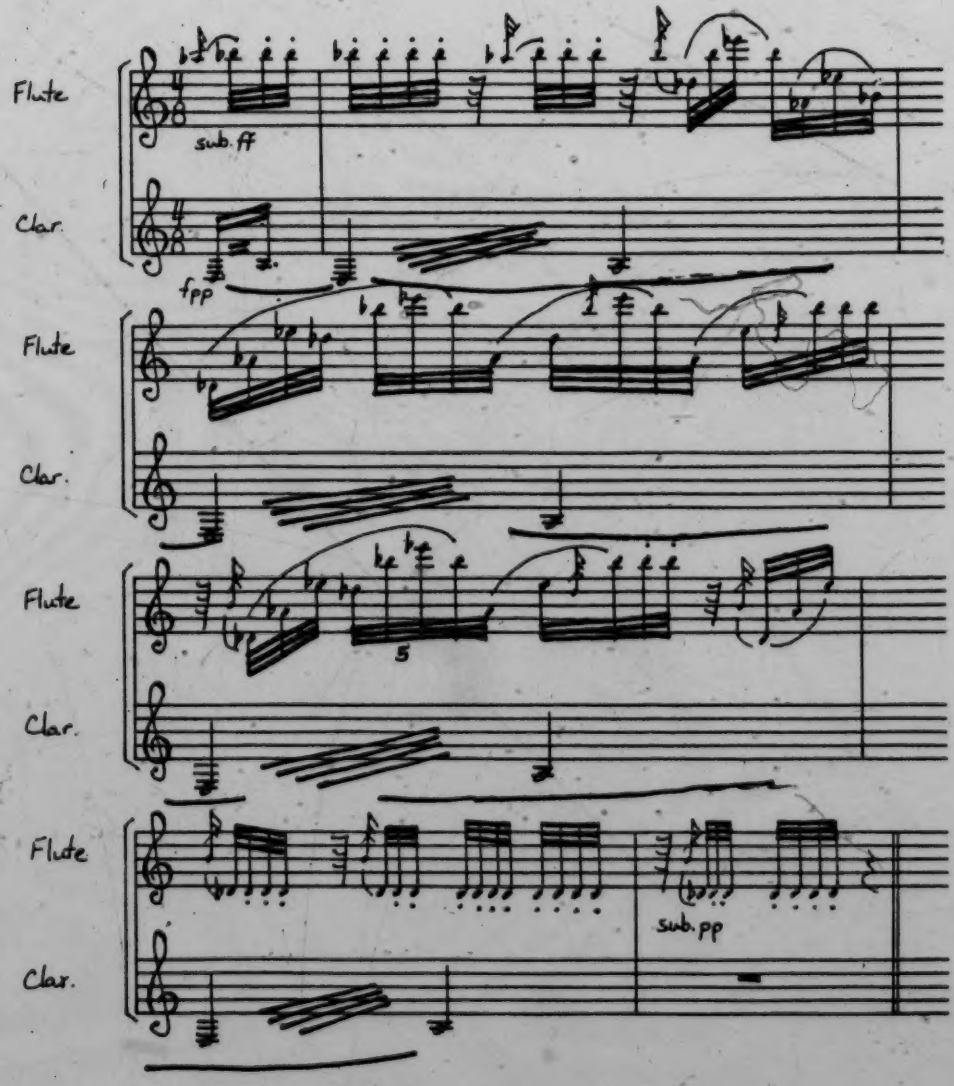
Vertical sonorities within this song are not as clear or as "traditional" as those in the previous songs. There are only two clear cadences within each section, both ending on a D minor triad (m. 6, m. 15 and their respective places in the repeated section).[9] For the most part, vertical structures are based on the ic 5 between flute and clarinet and added pcs in the viola and voice. Because of

the repetitive nature of the instrumental lines, the variety of chordal structures is restricted. The structures, based on ic 5, recall the vertical sonorities of the first song, while the addition of pcs is reminiscent of structures within the second song.

The last nine measures of each section are not serially derived. The harmonic structure initially is based on major and minor thirds ornamented by ic 1s. When the voice reenters (m. 19) the accompaniment is reduced to a single line shared by the three instruments. The vertical structures here are based almost entirely on ic 1 and ic 2. This section concludes with repeated dyads in the flute and clarinet which produce ic 5.

The coda (mm. 48-53) is shown in Example IX. The structure is quite straightforward with a clarinet tremolo using pcs 2 and 9 and an ornate passage for flute using pcs 1, 3, 8 and 10. These pcs are utilized in the accompaniment of P_0 and P_0R throughout the song. Further, these two collections indicate the two sets used in the song, P_0 in the flute and I_0 in the clarinet tremolo. Tension is created throughout the song by the juxtaposition of the two sets in the voice and in the elements of the repeated dyads in the flute and clarinet. Pcs 2 and 1 in particular, received attention throughout. The tension is resolved at the cadence in favor of pc 1 or more extensively P_0. The vertical sonorities of the coda are all based on ic 5 (pcs 2 and 9) with an added ic 1 (any pc from flute line), a structure which became prominent in the concluding measures of the second song.

The pitch centres throughout the three songs outline an ic 3 (C in the first song and $E^{\flat}$ in the second) and then chromatically fill

Example IX. Three Songs from William Shakespeare, P. 11, MM. 12-17.

this interval (concentration on both D and D♭ in the third song). The technique of using a chromatically-filled interval as the basis of pc content appeared in the first song of this collection and, indeed, becomes a prominent structural technique throughout Stravinsky's early serial works.

Throughout this collection of songs, the amount of serially organized material decreases and is replaced, particularly in the third song, by long sections which are not serially organized. The cadence structures throughout this collection show a progression from "traditional" to "nontraditional" sonorities. Sustained ic 5s formed the cadences of the first song and functioned around one pitch centre. The second song's cadences add ic 2 to the previous structure and function traditionally around two pitch centres. In the third song, vertical sonorities are based on ic 5 with added intervals, particularly ic 1 at the close of the song, and clear cut cadences are rare.

It is significant that the second and third songs are based on the same material. The second song utilizes two orderings of the series but only the second order receives extended use. The first ordering prepares the material of the third song. Harmonically the structures of these songs are very similar, both being based on ic 5s with added notes. The 1 dyad repeated throughout the second song recurs consistently in the flute and clarinet of the third song. This ic also becomes a significant harmonic component in both songs.

NOTES

[1]Babbitt, "Recent Stravinsky," p. 174.

[2]Ibid.

[3]Ward-Steinman, "Serial Techniques," p. 28.

[4]Nonserial sequences following the end of serial statements occur in the viola in mm. 5-6 and the clarinet and viola in mm. 9-10. Measure 6 of the clarinet presents serial material based on the first movement's row. See Ward-Steinman, "Serial Techniques," p. 30.

[5]Wolternik, "Harmonic Structure," p. 156.

[6]The two exceptions are the clarinet in mm. 4-5 and the flute in mm. 12-15. See Wolternik, "Harmonic Structure," p. 158.

[7]Wolternik, "Harmonic Structure," p. 159.

[8]Ward-Steinman, "Serial Techniques," pp. 31-32.

[9]Wolternik, "Harmonic Structure," pp. 164-65.

CHAPTER 5: In Memoriam Dylan Thomas

In Memoriam Dylan Thomas, completed in 1954, is Stravinsky's first work in which all material is serially organized. The overall form of the work is ternary; the A sections, entitled "Dirge-Canons", contain antiphonal quartets of trombones and strings, while the B section is a song for tenor accompanied by string quartet.

The series of this work contains five elements with no pc repetition (see Figure 5.1). The pc content of this series is a

Figure 5.1. Series of In Memoriam

$P_0 = 4, 3, 0, 1, 2$ $\quad\quad$ $\langle 4,3,2,1,0,0 \rangle$

collection of chromatically contiguous pcs within an ic 4. This series and that of the first of Three Songs are similar in that both span an ic 4. This series and the one from "Ricercar II" of the Cantata are similar in two respects. The first similarity is the predominance of pcs 0, 2 and 4 brought out by repetition in "Ricercar II" and by prominent placement in this row (located at the beginning, middle and end of this series[1]). The second similarity between these rows is that each has a C centre and both contain the major and minor third (pcs 3 and 4).

Although the vector indicates the possibility of four ics, Stravinsky's ordering of the row is restricted to only two, ics 1 and 3. The transposition which preserves maximum pc intersection occurs

at t=1 or t=11. "Further, the structure of the pentachord is such that there is, for the first time in Stravinsky's serial works, an inversional form which is a pitch permutation of the original unit."[2] This inversional row, I_8, is shown in Figure 5.2. As a result of the pc

Figure 5.2. Inversional Row with Same Pc Content as P_0

$I_8 = 0\ 1\ 4\ 3\ 2$

similarity between these rows, only twelve rows contain unique pc contents.

One very important aspect of this series is not worked out within this piece. This is the combining of rows in such a way as to achieve equal circulation of the twelve chromatic pcs. The total chromatic can be produced in two ways. Firstly, the total chromatic would be present with the adjacency of three series, each related by t=4 (see Figure 5.3a).[3] The second way to achieve the total chromatic

Figure 5.3. Possibilities for the Total Chromatic in *In Memoriam*

a) $P_0 = 4\ 3\ 0\ 1\ 2 \quad P_4 = 8\ 7\ 4\ 5\ 6 \quad P_8 = 0\ 11\ 8\ 9\ 10$

b) $\overbrace{4\ 3\ \underbrace{0\ 1\ 2}_{I_4R}}^{P_0}\ \overbrace{11\ 10,\ \underbrace{7\ 8\ 9\ 6\ 5,}_{I,R}}^{P_7}$

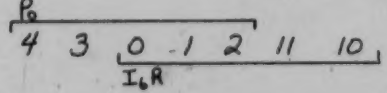
involves four conjunct rows and the technique of secondary sets (see Figure 5.3b). Maximal overlapping of rows is three pcs, which occurs in Figure 5.3b. This series is divisible into two row pairs (P_0 -I_4 R, P_7 -I, R) which are related by transposition at t=7. Stravinsky does not use either of these two methods and, therefore, a totally chromatic texture is avoided. Certain other pc collections, however, do become structurally important.

Throughout this work, the series appears only linearly and is confined to a single instrumental line. There are two methods used to link rows; the conjunct and disjunct methods.

> Stravinsky's choice of transposition level for the successive disjunct row forms most often results in other occurrences of these same melodic intervals [as found in the series, that is ics 1 and 3]. The only exceptions to this procedure result in melodic major seconds [ic 2] between disjunct pentachords. This occurs three times in each of the A2 sections (trombone 3, m. 10-11; trombone 2, m. 12; and the corresponding measures in the postlude), and once in the A3 section (trombone 1, mm. 19-20).[4]

Several possibilities exist for linking conjunct pentachords. The maximum number of pcs which could be common between two rows is three, as illustrated in Figure 5.4. This example is identical to the

Figure 5.4. Maximally Conjunct Rows in In Memoriam



first half of Figure 5.3b and is utilized three times. All three occurrences, using the rows I_6-P_0R, are in the vocal line of the song and appear in the verbal and musical refrain "Do not go gentle." Conjunct pentachords with two common notes are not found at all, and those with one common element are found in all instrumental parts and the vocal line.

The form of both the prelude and postlude are quite readily apparent and are indicated in Figure 5.5. The B sections recur without

Figure 5.5. Form of Prelude and Postlude

Prelude: A1 B A2 B A3

Postlude: B A2 B A1 B

alteration and act like ritornelli, while the A sections are canonic and vary with each repetition. In the postlude, while the B sections are repeated at the same pitch level, the A sections both occur at t=10. Throughout the prelude, the trombone quartet plays the A sections and the string quartet plays the B sections. This pattern of instrumentation is reversed in the postlude.

Although both movements are entitled "Dirge-Canons", the term canon can only be applied to the pitch relationships and then only because they are serially derived. Rhythmic imitation is very limited and occurs only with the initial repeated pc of canonic voices in the A sections.

The ritornelli are each constructed from four rows, as shown in Figure 5.6. Characteristic of this section are the use of all four

Figure 5.6. Rows of Ritornelli of "Dirge-Canons"

I_{10} = 2 3 6 5 4

P_0 = 4 3 0 1 2 ┐

P_0R = 2 1 0 3 4 ┤ identical pc collections

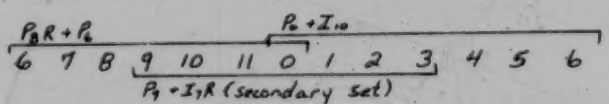
I_8R = 2 3 4 1 0 ┘

row forms and the use of three rows which are permutations of the same pc collection (indicated by bracket in Figure 5.6). I_{10}, the only row with a unique pc collection, shares three common pcs with all other rows. The total pc content of these ritornelli sections, then, is extended to chromatically fill an ic 6 (pcs 0 through 6).

Both of these techniques, the use of permutations of the same pc collection and the expansion to conform with the use of chromatic

tritones, figure prominently in the serial construction of the A sections. The rows used in the A1 and A2 sections of the prelude are shown in Figure 5.7. Examining the A1 section first, we find that the initial row pair (P_0 -I_{10} in trombone 2) produces the same chromatically-filled tritone as the ritornelli (pcs 0 through 6). The same row pair is found in the fourth trombone part. The next two row pairs occur in different instrumental lines. In the third and first trombones, the row pair (P_8R-P_6) produces a chromatically-filled tritone, which is the complement of the original set (pcs 6 through 0). The last row pair (P_9 in trombone 2 and I_7R in trombone 3) produces a chromatically-filled tritone which acts like a secondary set to the previous collections, as shown in Figure 5.8.

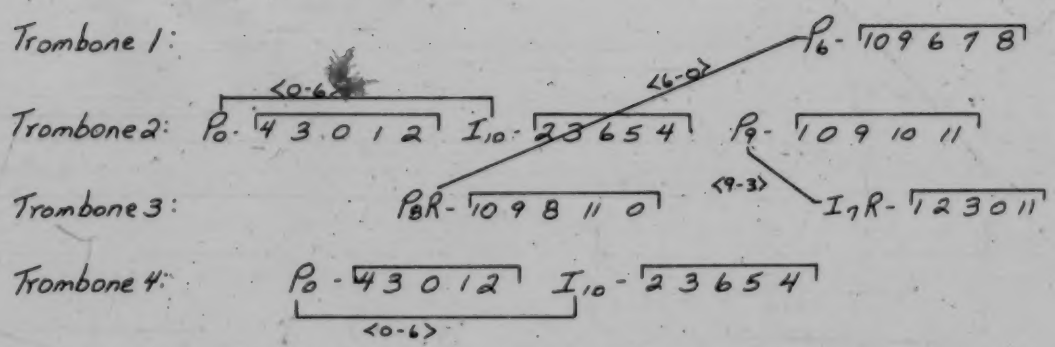
Figure 5.8. Rows of A1 Section of "Dirge-Canons"



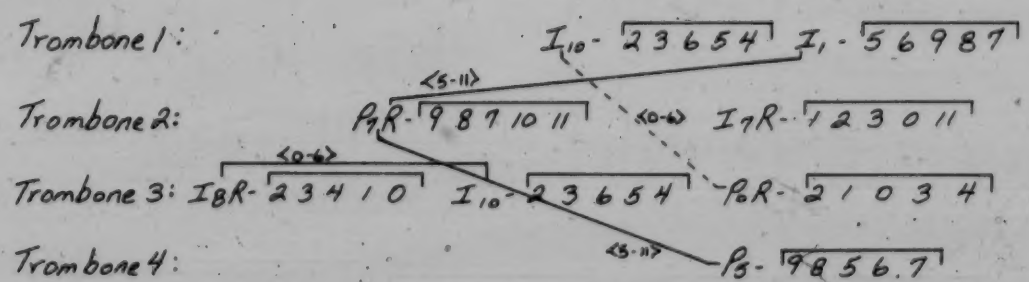
Canon A2 shows similar structures to the A1 section, except the tritone collections stated are not complementary sets. There are two different tritone collections stated; 0 through 6 occurs twice (I_8R-I_{10} and P_0R-I_{10}) and pcs 5 through 11 is also stated twice (P_7R-P_5 and P_7R-I_1). Two pairs of rows represent pc permutations (I_8R-P_0R and I_1-P_5). Although the two tritone collections are not complementary, they do provide the total chromatic. One row, I_7R, does not form a chromatically-filled tritone collection with any other row but does act like a secondary set to the stated tritone collections (see Figure 5.9).

Figure 5.7. Rows used in Canons A1 and A2 of "Dirge-Canons"

Canon A1

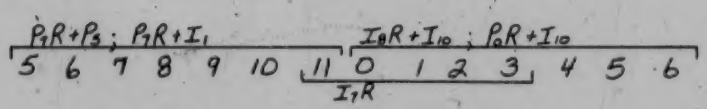


Canon A2



<0-6> indicates all pcs between 0 and 6 (chromatically-filled tritones produced by row pairs)

Figure 5.9. Rows of A2 Section of "Dirge-Canons"



Canon A3 is shown in Figure 5.10. Initially two row pairs are stated which form chromatically-filled tritones. Neither of these tritones have been used previously; pcs 8 through 2 in $P_{10}R$-I_4R and pcs 1 through 7 in I_9R-$I_{11}R$. Three rows stated have the same pc content (P_2, $I_{10}R$ and I_{10}) and each set is a subset of the tritone formed by I_9R and $I_{11}R$. Likewise, P_9 is a subset of the tritone formed by $P_{10}R$ and I_4R.

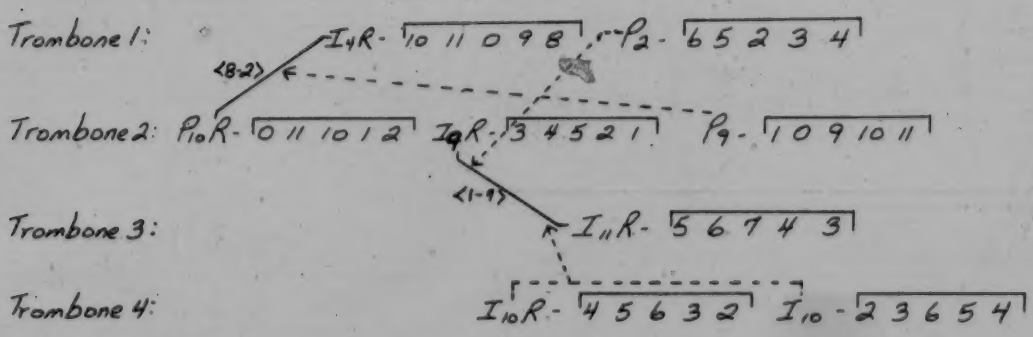
Throughout all three canonic A sections, two tritone collections are stated which produce the total chromatic within each section. There is one important aspect of construction which relates to the canonic A section.

> The sudden contraction of pc content from the total chromatic in the canons to the chromatically filled C-F# tritone in the ritornelli helps give the ritornelli a more well-defined, almost "home-key" effect--although there are also other reasons for this effect, perhaps the strongest of which is the literal repetition of the ritornelli. Thus, the fact that the "Prelude" ends with a canonic section causes it to be open-ended and allows it to lead into the "Song," while the conclusion of the "Postlude" with a statement of the ritornello effectively closes both the movement and the work.[5]

Wolternik has observed an interesting harmonic relationship which progresses through the canonic sections.

> Although the vertical structure of the simultaneities does not display much consistency, tonal references are not entirely absent from the texture. [Canon A1] in particular contains frequent tertian triads and "seventh chords" and even an occasional tonal progression. [Canon A2] is slightly less saturated with such harmonies, while in [Canon A3] no pure tertian triads or "seventh chords" are found at all. The sequence of canons in the

Figure 5.10. Rows used in Canon A3 of "Dirge-Canons"



<0-6> indicates chromatically-filled tritone formed by row pairs

- - - - - - - → indicates pc content of row is subset of chromatic tritone

> "Prelude", therefore, represents a progressive reduction in the occurrence of tertian harmonies, while the "Postlude", reversing the order of the canons, gradually returns to a more tertian harmonic basis. The ritornelli, like [Canon A3], contain no purely tertian structures, interfering to some degree with the orderly change in vertical organization represented by the canons. They provide a static, recurrent plane which contrasts with the active and changing plane of the canons, a feature which is emphasized by the contrasting instrumentation.[6]

Clemmons views the basis of the prelude as a duality set up by the two overlapping spans of five chromatic pcs (see Figure 5.11),

Figure 5.11. Pc Content of "Dirge-Canons"

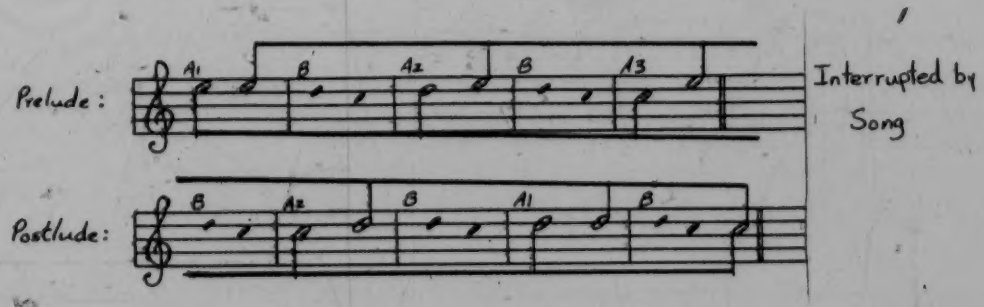
Region I	Region II
C D E	D E F#
C# D#	D# F

centered on D and E respectively. Region I is associated with the rows P_0, I_8 and their retrogrades, while P_2 and I_{10} are associated with region II. The emphasis on these rows accounts for the high frequency of pcs 0 through 6 within this movement. As a result, other pcs are relegated to a position of less structural importance. With the transposition level of the postlude (A sections at t=10), the duality of pc regions is resolved in favor of the D-centered region I. "This shift from E to D parallels the relationship of the initial to the final element in the basic set. Seen in this light, the significance and inevitability of many structural aspects become clear."[7]

The canons of the prelude begin on pcs 4, 2 and 0 respectively, which are the "diatonic" elements of the basic set, while in the postlude the canons begin on pcs 0 and 2. The cadences of the prelude canons all have a pc 4 root, while in the postlude the cadences have pc 2 roots. The ritornelli all begin on D and end with a cadence on

pc 0. This idea is illustrated more clearly in Figure 5.12. From

Figure 5.12. Descending Structures in "Dirge-Canons"[8]



this diagram, it can be seen that there are two lines which descend from pc 4 to 0. In both cases, the descent is interrupted by the ritornelli (B sections) and the song. The initial pcs of each canon finish their descent by the end of the prelude and through the postlude essentially sustain this pc. The descent of the cadencing sonorities, however, is delayed until the postlude.[8]

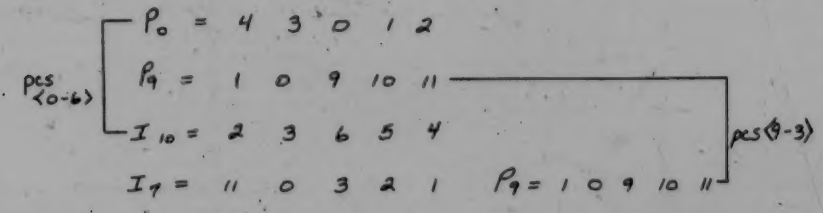
Throughout the "Dirge-Canons", we have found a progression of both harmonic units and lines of initial and final elements, as well as tension created between sections using chromatically-filled tritones and others utilizing the total chromatic.

We will now examine the song to see if its structure is related to that of the canons. The form of the poem, a vianelle, dictates the musical form. The poem is divided into six stanzas, each consisting of three lines. The first and last line of the initial stanza recur alternately as the last line of successive stanzas and both return at the end of the last stanza. For the most part, these sung refrains retain the same musical setting. In addition, there is an instrumental

refrain which acts as a prelude, interlude and postlude.

The instrumental refrain consists of five serial statements which are shown in Figure 5.13. It should be noted that this instrumental

Figure 5.13. Instrumental Refrain of Song



interlude is overlapped with the beginning of the sixth stanza (mm. 44-45). This refrain shows a structural similarity with the recurrent sections of the canons. The similarity is the combining of row pairs which produce chromatically- filled tritones. In the present example, two tritone collections are formed by row pairs (pcs 0-6 in P_0 -I_{10}; pcs 9-3 in I_7 -P_9). It is interesting that although the 'cello presents the series I_7 and P_9 which have three common pcs, their arrangement utilizes only one pc overlapping between the two statements. The total pc content of this refrain is a chromatically-filled ic 9. Each stanza of this song contains the total chromatic and in contrast, the refrains present a smaller pc set. The contrast of pc content is related to the structure of the "Dirge-Canons", although in the latter the pc content alternates between the total chromatic and the chromatically-filled tritone.

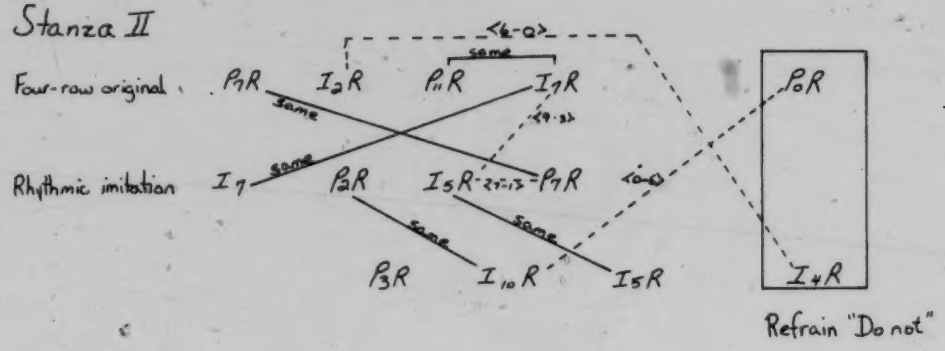
The two sung refrains are shown in Figure 5.14. The first sung refrain, "Do not go gentle", occurs four times, three of which use the musical setting shown in this figure. The fourth occurrence of this

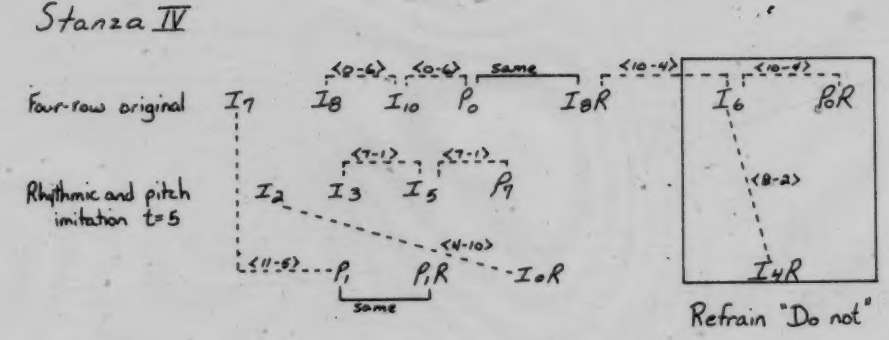
Figure 5.14. Sung Refrains in Song

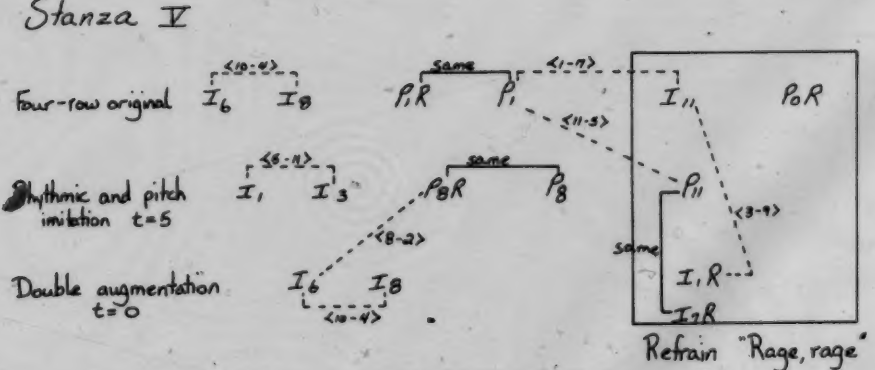
refrain (mm. 17-18) adds additional material, although the endings are very similar. This refrain contains the only example of maximal overlapping of adjacent rows (I_6-P_0R) within this piece. Two chromatically-filled tritone collections are produced (pcs 8-2 and 10-4). The second sung refrain, "Rage, rage", occurs four times within the song and in each case the musical setting is identical. Within this refrain, two rows contain identical pc content (P_{11}-I_7R) and one row pair produces a chromatically-filled tritone (P_8-I_1R, pcs 3-9). Both sung refrains will receive additional comment in connection with the stanzas in which they are contained.

Within the stanzas, there are three which have rhythmic imitation between the voice and the instruments and these are shown in Figure 5.15. In each case, imitation involves four rows in each line. Pitch imitation, at t=5, is also present in stanzas four and five. Imitation in stanzas four and five occurs between the voice and first violin, while in stanza two it is between voice and 'cello. The sequence of rows which share rhythmic imitation in the second stanza are, for the most part, related by inversion at the same transposition level. Either $I_7(R)$ or P_7R function as endpoints of each imitative line. The third and fourth rows of each imitative line are related, although P_8R-I_7R in the voice share the same pc content, while I_5R-P_7R in the 'cello produce the chromatically-filled tritone pcs 7 through 1. Throughout the entire stanza, several tritones are formed between row pairs; I_5R-I_7R (pcs 9-3), P_2R ($I_{10}R$)-P_0 (pcs 0-6) and I_2R-I_4R (pcs 6-0). Essentially every row stated either shares the same pc content or produces a chromatically-filled tritone with another row. The only

Figure 5.15. Pitch and Rhythm Imitations in Song-







exception to this is P_3R. This row, however, contains the same pc content as I_{11}, which would have been the third row in the 'cello if the inversional relationship between imitative parts had been continued. With the substitution of I_5, tritones are produced with both the initial and final rows of the imitative sequence ($I_7(R)$ and P_7R). One pair of complementary sets (pcs 6-0 and 0-6) are present. Each of these collections is produced by a row pair, of which the first row is the second in the imitative sequence and the last is from the sung refrain "Do not go gentle." The first sung refrain which concludes this stanza is not in its usual musical setting. Linearly at this point (mm. 16-17), the rows are not stated in one timbre, instead pc 11 from the tenor in measure 16 is elongated in the 'cello, viola and tenor before the beginning of the next row. Also at this point, the tenor anticipates the first two pcs of the new 'cello row (pcs 9 and 8).

There are three distinct lines within stanza four. The first two (voice and first violin) are imitative in respect to rhythm and pitch. The transposition level between these lines, t=5, is such that although complementary tritone collections are not produced, the total chromatic is present. The initial row of each imitative line is not related to any row in the same line, but in combination with a row from the third line, chromatically-filled tritones result. The conclusion of this stanza is the usual setting of the first sung refrain. This refrain is connected to the vocal line by a chromatically-filled tritone structure.

The fifth stanza is also organized into three distinct lines

(see Example X). The first two lines are again imitative in respect to both rhythm and pitch at t=5. This is the same relationship as in the fourth stanza. The third line adds untransposed pitch imitation in double augmentation of the vocal line. This is the only stanza in which three lines are involved in the canonic structure. The conclusion of this stanza is the second sung refrain, "Rage, rage", and is connected to the preceding section by two chromatically-filled tritone structures.

The canonic imitation throughout this group of stanzas shows a progression towards greater complexity. Each stanza contains three independent lines, of which only two are rhythmically imitative in the second stanza (although pitch imitation is suggested). This progresses to stanza four, in which two lines are canonic (pitch and rhythmic imitation) and the third line forms tritone collections with rows from the canon. The progression is completed in the fifth stanza where all three lines are included in the canonic texture.

The serial structure of stanzas one and six are shown in Figure 5.16. These stanzas are similar in that each contains both sung refrains. The sung refrains occur at the beginning and end of stanza one, while both appear at the end of stanza six. In addition, the instrumental interlude occurs simultaneously with the beginning of the sixth stanza. Therefore, both of these stanzas begin and end with refrain material. In both cases, the serial material between refrains are not internally related, but in every case these rows are related to rows in the refrain material, either by pc content or chromatically-filled tritone collections. In stanza one,

Example X. In Memoriam Dylan Thomas, P. 8 M. 6- P. 9 M. 2.

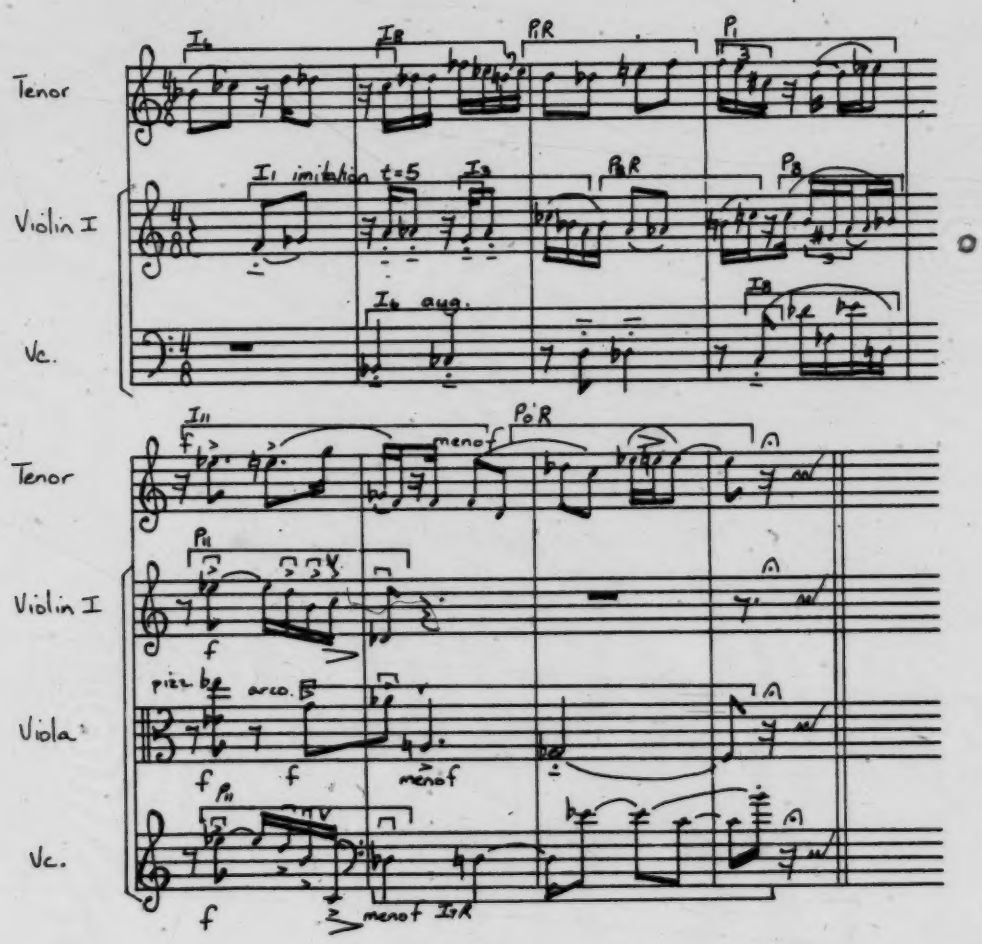
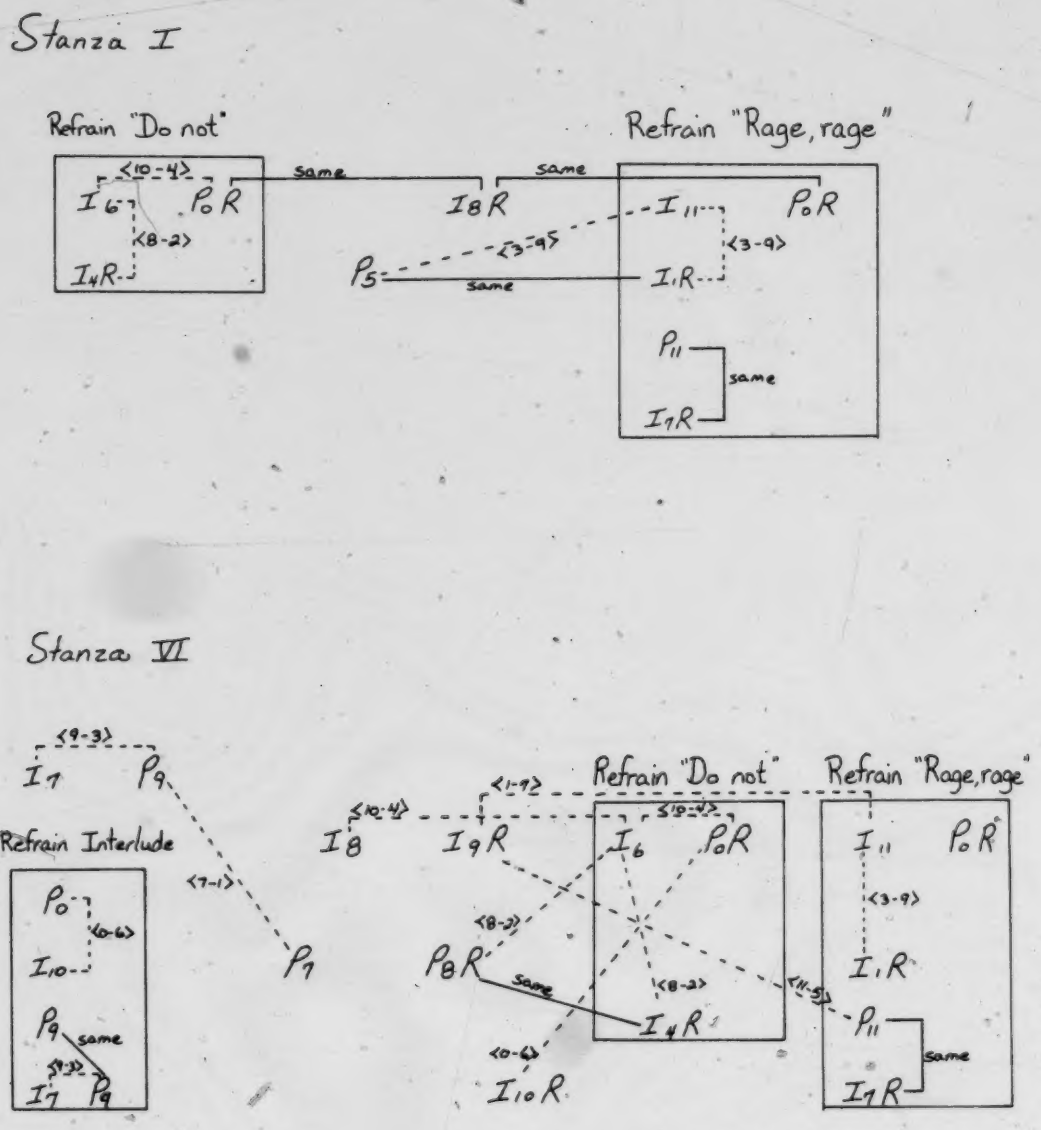



Figure 5.16. Stanzas One and Six of the Song



this central non-refrain section consists of only two rows (P_5, I_8 R), while five rows are included in this section of the sixth stanza. While similarities exist between these two stanzas, the sixth is more complex because of the inclusion of all three refrains and more material in the central non-refrain section.

Stanza three, which is not structurally related to any other, is shown in Figure 5.17. There are a large number of serial statements in this stanza which share the same pc content. Figure 5.17a is a simplified version stating only one row from a group which shares pc content. Tritone collections are utilized in two ways. The first way is in local relationships (that is, produced by adjacent rows) such as the row pairs P_4-P_7, P_7-I_1, I_5R-I_3R, P_0-I_{10} and I_{11}-I_1R. The second method of producing tritone collections involves repetition and longer relationships. The row pair P_0-I_{10} is extended throughout the entire stanza by repetition of rows with identical pc contents. Two other row pairs extend over the whole stanza (I_4R-I_2R, P_9-P_{11}), although in neither case are there as many rows stated as in the P_0-I_{10} group.

The song, as a whole, shows some structural similarities with the "Dirge-Canons", namely the alternation of sections containing the total chromatic and those containing less than the total. In addition, the use of a refrain is important in both movements, although the song uses a complex plan involving three musical refrains. The choice of rows in both movements is regulated by two means, either preservation of pc content or pairing of rows which form chromatically-filled tritone collections.

Figure 5.17. Stanza Three of the Song

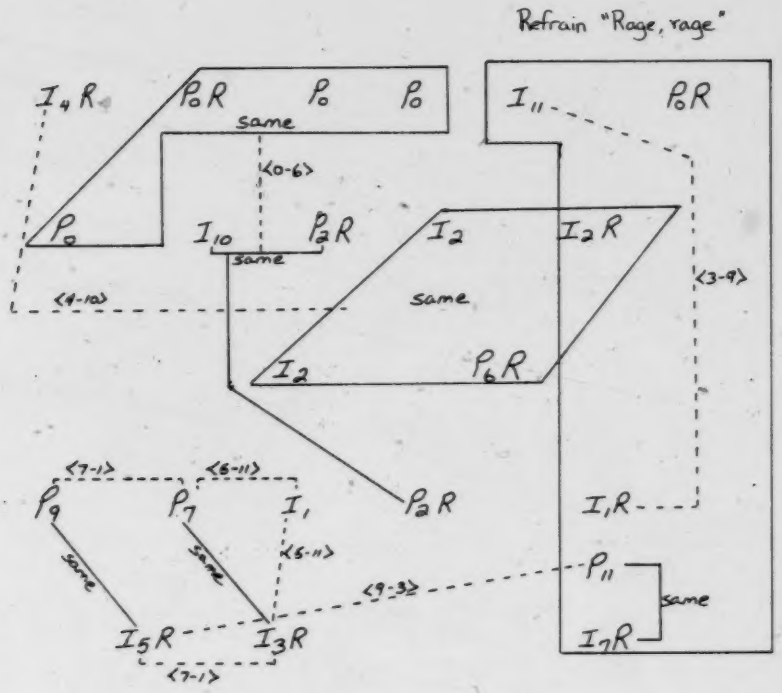
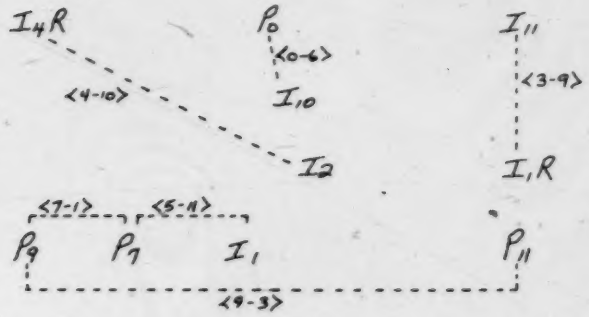
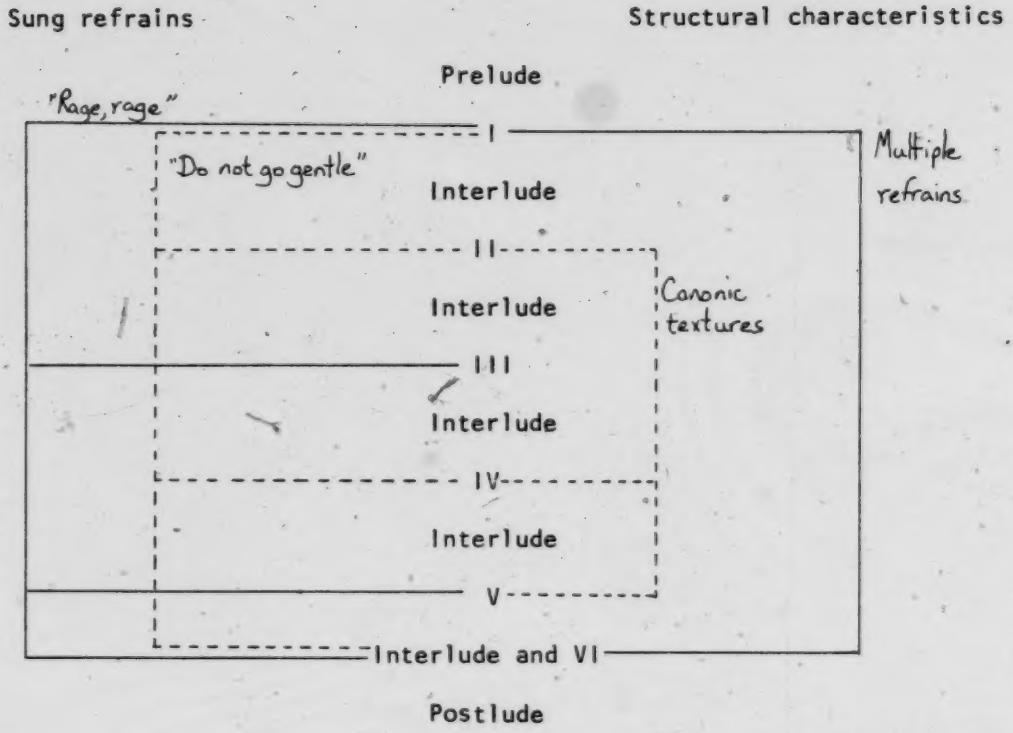


Figure 5.17a. Simplified Version



The form of the song is quite complex and, as is typical of Stravinsky, ambiguity of relations exist. The structural similarities between stanzas are illustrated in Figure 5.18. The basic structure involves the alternation of the instrumental refrain (prelude, interlude and postlude) with six sung stanzas. Similarities within stanzas involve two levels, the sung refrains and structural characteristics. This is where ambiguity arises. Stanzas one and six are related in both respects. Stanzas two and four are related by the use of the first sung refrain ("Do not go gentle"), while the appearance of the second sung refrain ("Rage, rage") connects stanzas three and five. If structural characteristics are considered, stanzas two, four and five are related by their canonic texture. Stanza three stands alone with its main structural characteristic being the stating of groups of sets with identical pc content.

Figure 5.18. Form of the Song



NOTES

[1]Wolternik, "Harmonic Structure," pp. 171-72.

[2]Babbitt, "Recent Stravinsky," p. 175.

[3]Ward-Steinman, "Serial Techniques," p. 38.

[4]W.R. Clemmons, "The coordination of motivic and harmonic elements in the 'Dirge-Canons' of Stravinsky's In Memoriam Dylan Thomas," In Theory Only (3/1 April, 1977), p. 10.

[5]Wolternik, "Harmonic Structure," p. 174.

[6]Ibid., p. 175.

[7]Clemmons, "Motivic and Harmonic Elements," pp. 15-16.

[8]Wolternik, "Harmonic Structure," p. 178.

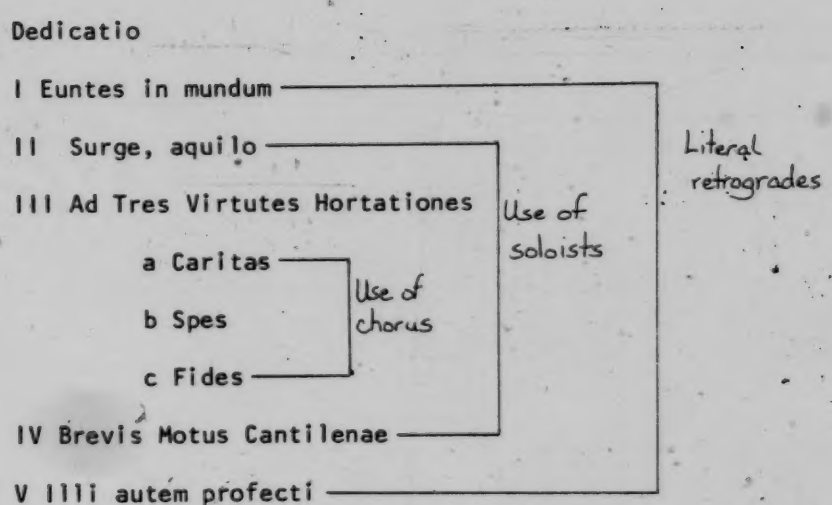
CHAPTER 6: CANTICUM SACRUM

The first performance of Canticum Sacrum was at the 1956 Festival of Contemporary Music in Venice. As Craft illustrates, the piece is constructed to reflect the architecture of Saint Mark's cathedral in Venice.[1] Figure 6.1 indicates the symmetrical arrangement of movements. The form (with the exception of the Dedicatio) is symmetrical. The fifth movement is an almost exact retrograde of the first. The other relationships are less strict, with the second and fourth movements being related by their use of soloists (tenor and baritone respectively). The central movement is divided into three submovements, the outer pair of which are similar in their use of chorus and their largely canonic structure. The central submovement, "Spes", is the focal point of the entire work.

The three central movements contain serially-derived material and within this study our comments will be restricted to these movements. There are two distinct twelve-tone rows utilized, one for the second movement and the other for the third and fourth movements. It is important that although this is Stravinsky's first work to use a twelve-note series, there are also movements which are devoid of serial organization. In the two previous works, rows were used which contained less than twelve notes but all movements contained serially-derived material.

We will compare the two rows used in this work before examining

Figure 6.1. Symmetrical Arrangement of Movements in Canticum Sacrum



each movement more closely. The series are identified as C.S.(1), used for the second movement, and C.S.(2), utilized for the third and fourth movements (see Figure 6.2). Both rows have hexachordal

Figure 6.2. Series used in Canticum Sacrum

C.S.(1) = 8 7 5 2 6 4 | 3 1 10 0 11 9
(1-2-3-4-2-1-2-3-2-1-2)

C.S.(2) = 9 8 10 0 1 11 | 4 3 6 2 5 7
(1-2-2-1-2-5-1-3-4-3-2)

subdivisions and opposing hexachords between rows share near maximal pc intersection (five pcs in common). The hexachords of C.S.(1) are identical under the operation inversion, while those of C.S.(2) are identical under the operations inversion and transposition. The pair of ics 1 and 2 occur multiply in each row, although neither direction nor order is consistent. The second hexachord of C.S.(2) occurs in retrograde order in C.S.(1), in order positions two through seven, with one reordering (pcs 3 and 4). Also occurring in both series is the pc segment 10, 0, 1 and 11 in unordered format. More specific characteristics of each row's structure will be commented on at a later point.

"Surge, aquilo"

This movement is scored for tenor solo, flute, english horn, harp and three double basses. For the most part, the accompaniment is restricted to one instrumental line, although it is increased to two at the end of important formal sections.

The C.S.(1) series, as shown in Figure 6.3, defines all the

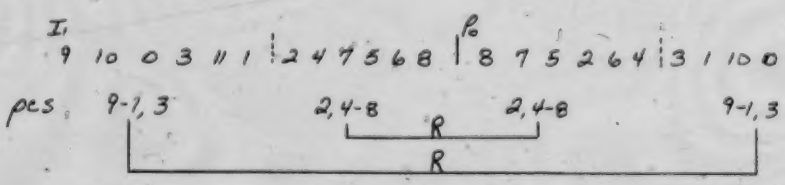
Figure 6.3. Series used in "Surge, aquilo"

P_0 = 8 7 5 2 6 4 | 3 1 10 0 11 9

I_1R = 8 6 5 7 4 2 | 1 11 3 0 10 9

material within this movement and, as has already been mentioned, the hexachordal segments are identical under the operation inversion. Figure 6.3 also shows the inversional row which maintains identical hexachordal pc content with the prime, although the ordering is permutated. This feature allows for the combinatorial properties of aggregate and secondary sets. This relationship occurs only once within the movement (tenor line mm. 86-93, see Example XI). The rows used are I, followed by P_0 and, as a result, neither an aggregate or a secondary set is formed. With regard only to the pc content of the hexachords, a retrograde relationship is established (see Figure 6.4). Although the possibility of combinatorial relationships exists,

Figure 6.4. Tenor Line mm. 86-93 "Surge, aquilo"



Stravinsky does not utilize them. The hexachordal subdivisions, however, do become significant.

Invariance is also available among segments with a smaller number of elements. The ic pattern 1-2 occurs three times in the series (order positions one to three, six to eight, and ten to twelve). The direction and order of ics remain constant and, therefore, three ordered segments are produced which are identical under the operation

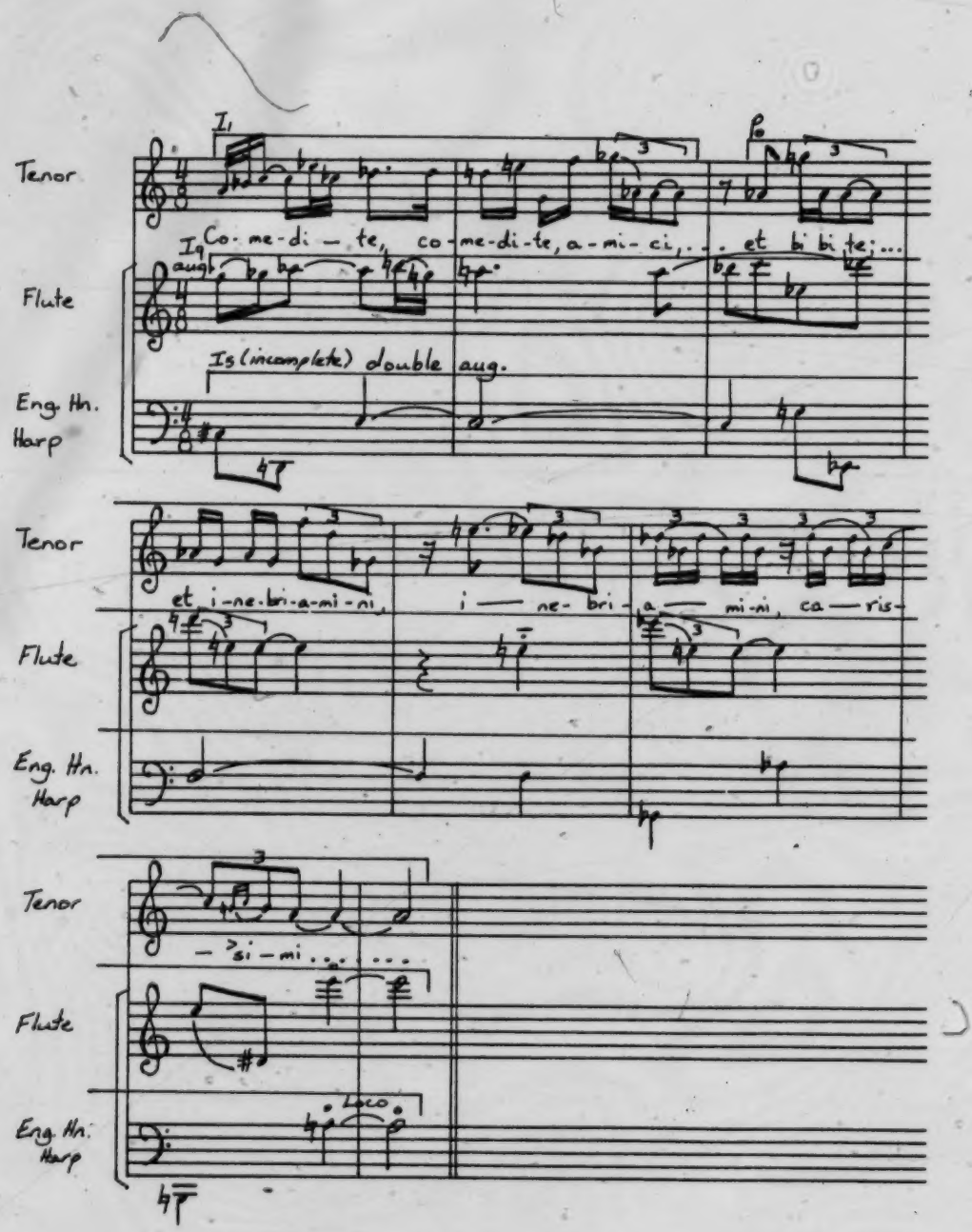
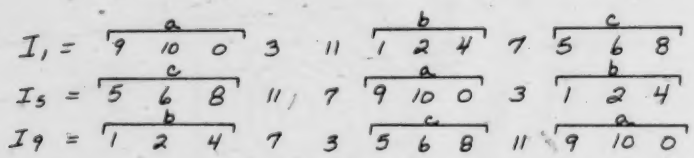
Example XI. Canticum Sacrum, MM. 86-93 (P. 15, MM. 7-14).

transposition. As a result of this structure, all three segments are held invariant under two levels of transposition, t=4 and t=8, as illustrated in Figure 6.5. The invariant segments are also retained

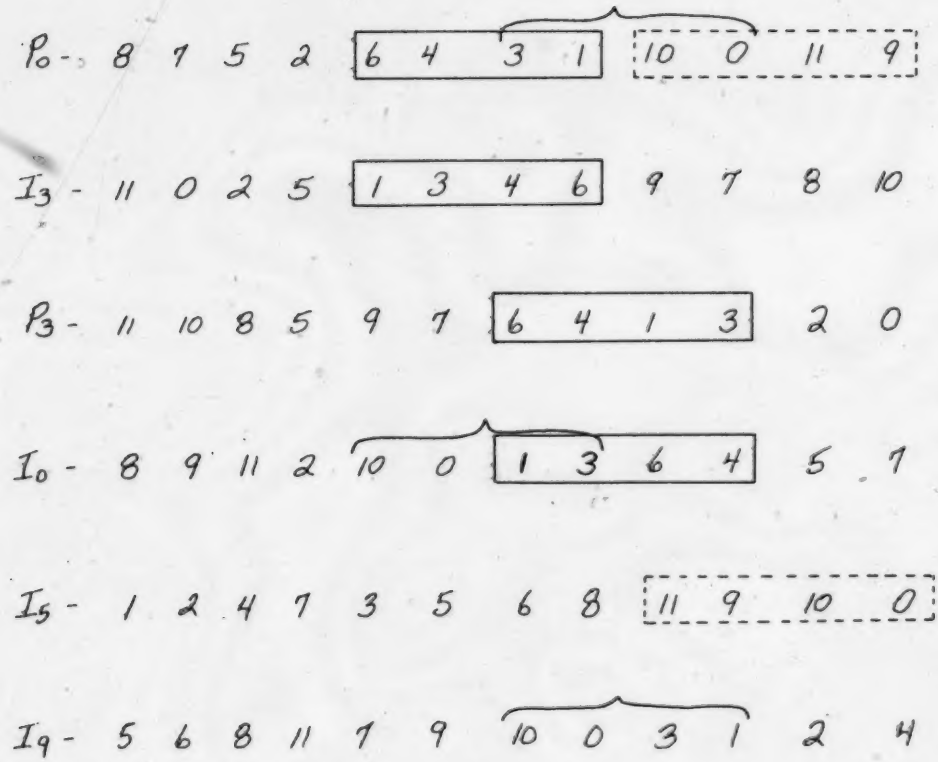
Figure 6.5. Invariant Three-note Segments

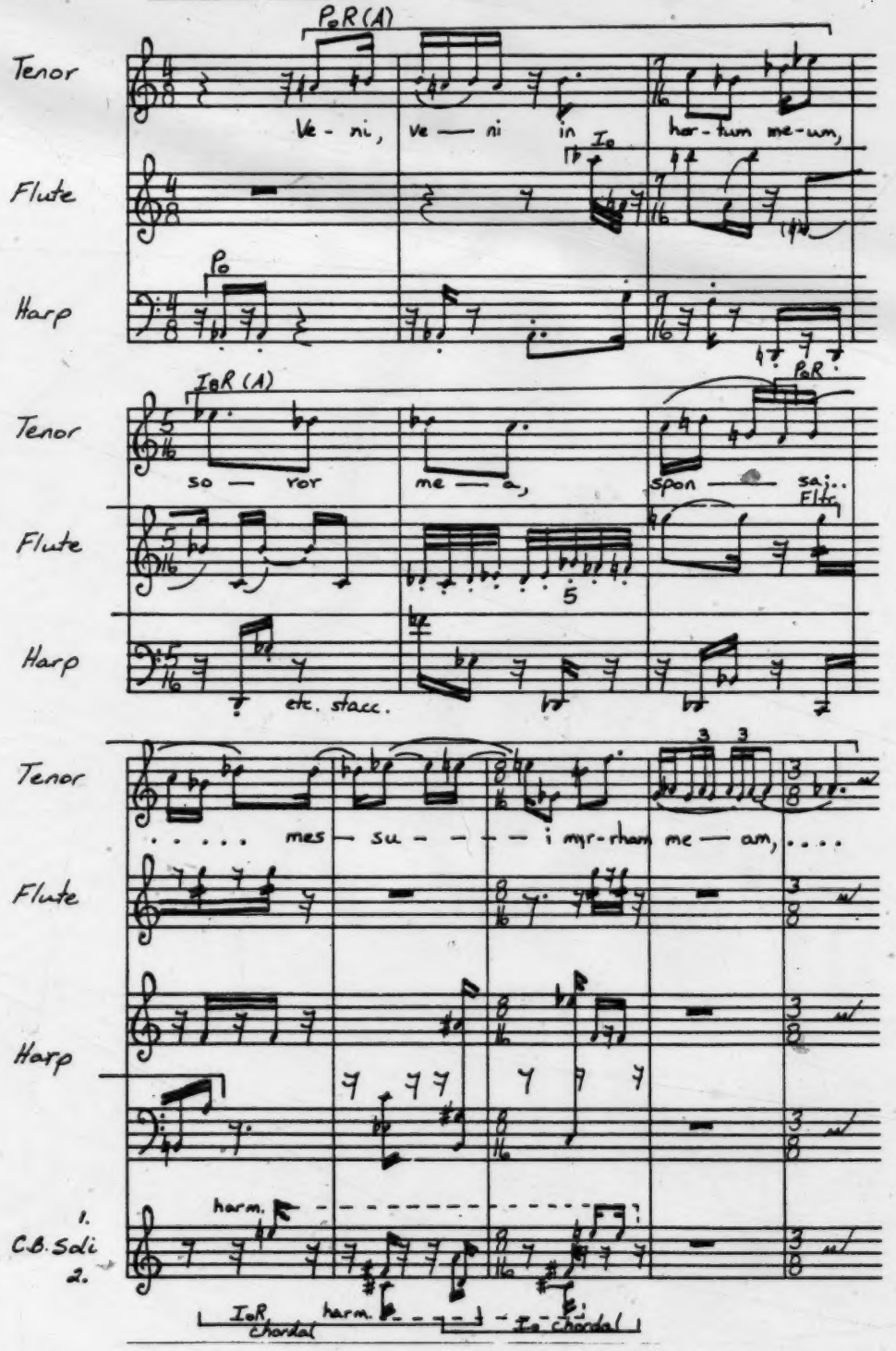


in the same order positions in these rows. This structure involves maximal invariance of ordered segments and is utilized near the end of the movement (mm. 86-93, see Example XI). This section uses the rows of Figure 6.5 in rhythmic canon, with the voice stating I_1, the flute I_9 in augmentation and the harp and english horn state I_5 in double augmentation.

Invariance of unordered four-note segments is also available within this series. Figure 6.6 shows all rows which share at least one four-note segment with P_0. There are a total of three segments involved and for each segment at least two rows preserve it in the same order positions. I_0 alone holds two segments invariant with P_0. All of these invariant relationships are used, except P_0 and I_3. At the end of the second formal section (mm. 63-72, see Example XII), the rows utilized are P_0, I_0, $P_0R(A)$, $I_8R(A)$, P_0, I_0R and I_0. The pc segments 3, 1, 6, 4 and 10, 0, 3, 1 are multiply represented, five times for the former and six times for the latter. At the conclusion of the third formal section and the movement (see Example XI), the rows used are P_0, I_9 and I_5 and the segments 11, 9, 10, 0 and 10, 0,

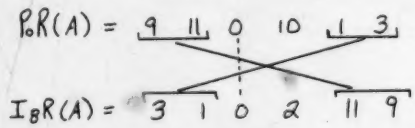
Figure 6.6. Invariant Four-note Segments



Example XII. Canticum Sacrum, MM. 63-73 (P. 14, MM. 6-16).

3, 1 are each held invariant once.

Also of significance is a pair of hexachords which recur throughout the tenor line, the first hexachords of both P_0R and I_8R (see Figure 6.7). These are the only hexachords used independently

Figure 6.7. Hexachords used independently in "Surge, aquilo"



within the movement and they are always linearly adjacent. The hexachords display near maximal invariance (five pcs in common), although total invariance is available between inversional rows. Why then has Stravinsky chosen these two hexachords? The answer is two-fold. Firstly, the order of the second hexachord in Figure 6.7 strongly implies retrograde motion, with the initial and final pc pairs indicating exact retrograde and the internal pc pair shows both order reversal and the inclusion of a new pc (pc 2). Comparing this figure with that of total pc invariance (see Figure 6.3), we find that the latter has almost no invariance with regard to ordering. The pair of hexachords chosen, then, produce an interesting combination of near maximal invariance with minimal reordering. The second reason for choosing this pair of hexachords is the consideration of the total pc content. With the insertion of a new pc in the second hexachord, the pc content is extended to include all the chromatic pcs within an ic 6 (the tritone, 9-3). The technique of including all chromatically adjacent pcs within a certain ic is characteristic of Stravinsky's early serial practice. It should be

noted that in three of the previous works (first of Three Songs, Cantata and In Memoriam) chromatically-filled ics became structurally significant and in the last two mentioned the ic was 6, the same as produced in the present work. Within the Cantata, even the same row pair was used to produce the chromatically-filled ic (P_o and I_8). This pair of hexachords, then, produce an implied (because it is not exact) retrograde relationship, with tension and ambiguity being created between the pc contents of the pair.

The entire tenor line of the first section (mm. 47-55) is illustrated in Figure 6.8. The sequence of rows consists of the hexachord pair enclosed by two twelve-note rows. As has been mentioned, the hexachord pair produces an implied retrograde relationship. The twelve-note rows surrounding it (P_o and $P_o R$) produce an exact retrograde relationship (as indicated by the brackets above the rows in the figure). Indicated by the brackets below the rows in the figure are the implied and exact retrograde relations between each of the hexachords and the hexachord subdivisions of the adjacent complete serial statements. Also indicated in this figure is the implied retrograde relationship encompassing the entire section. The relationship found in the local region of the hexachord pair has been expanded to dictate the structure of the entire section. Although the remainder of the tenor line does not restate this sequence of rows, it is closely related in structure.

The tenor line of the second section (mm. 58-73) is diagrammed in Figure 6.9. This section consists of four serial statements and is the same as the first section except that I_8 replaces the initial

Figure 6.8. Tenor Line mm. 47-55 "Surge, aquilo"

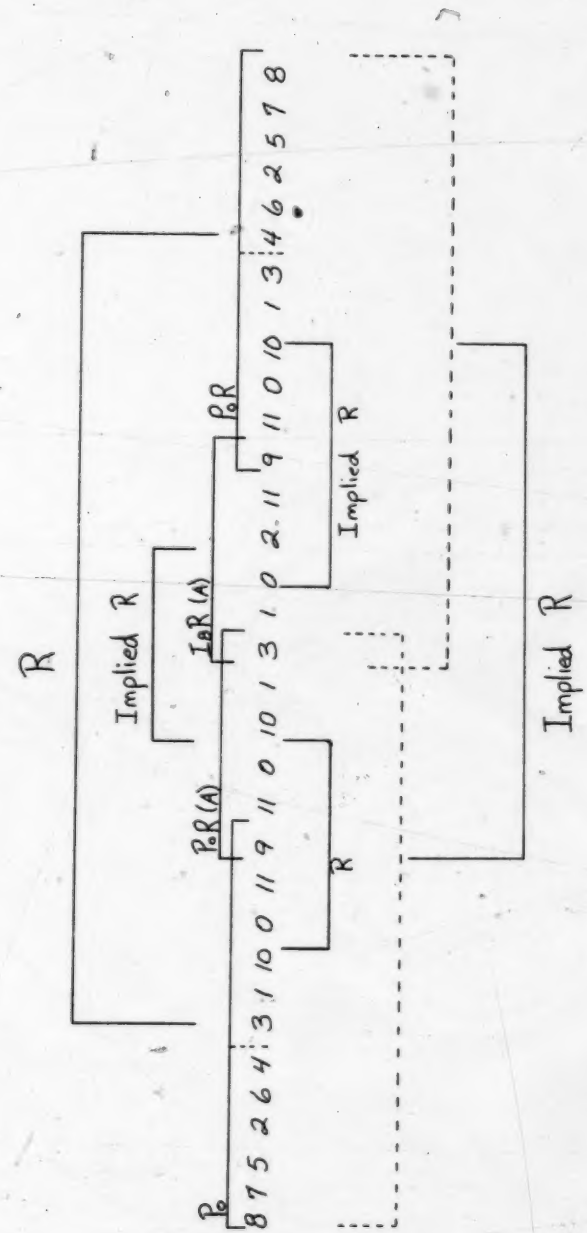
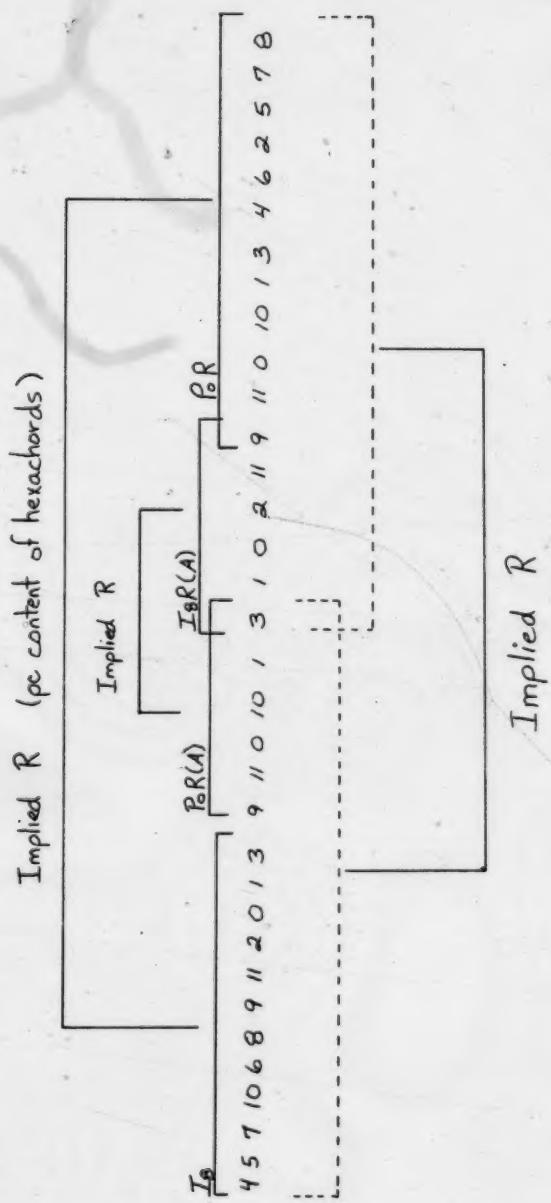
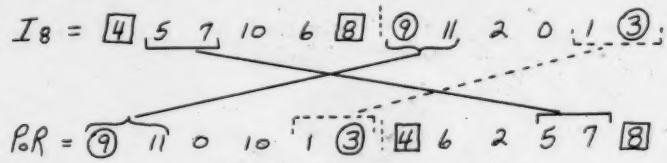


Figure 6.9. Tenor Line mm. 58-73 "Surge, aquilo"


Implied R (pc content of hexachords)
Implied R
Implied R
I8R(A)
P8R
P8R(A)
I8
4 5 7 10 6 8 9 11 2 0 1 3 9 11 0 10 1 3 10 1 3 1 0 2 11 9 11 0 10 1 3 4 6 2 5 7 8

row (P_o). This replacement results in an implied retrograde relationship (referring only to hexachordal pc content) between twelve-note rows. These two rows have several similarities which are shown in Figure 6.10. Opposite hexachords from these two rows contain near

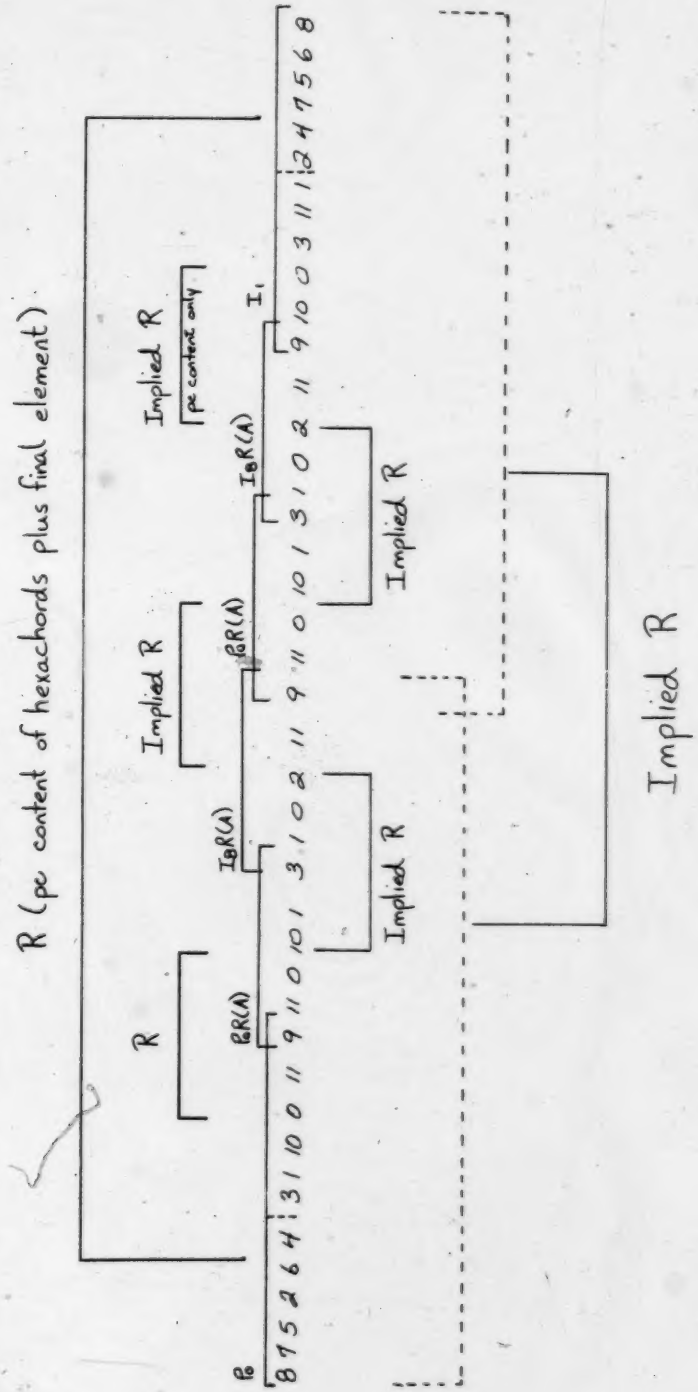
Figure 6.10. Similarities between I_8 and $P_o R$



maximal invariance (five pcs in common). The only pcs which are not retained in their proper hexachords are 10 and 2, the same pair of pcs which were not held invariant between the initial hexachord pair. This slight alteration of total invariance and, hence, its implied relationship is now displayed over a longer time span than the original statement. Within the hexachords of these two rows a prime relationship seems evident. Evidence of this are the retention of pcs 4 and 9 as initial hexachordal elements, the retention of pcs 8 and 3 as final elements, and the preservation of three ordered dyads (pcs 5-7, 9-11 and 1-3). The relationship between these two rows is rather complex, with an implied retrograde relation, involving only pc content, between the hexachords but indications of prime relations are set up within the ordered pc content of the hexachords.

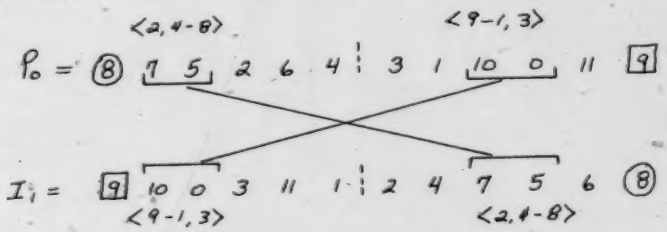
The tenor line of the third, and final, section (mm. 74-87) is illustrated in Figure 6.11. The section consists of six serial statements and the extension is achieved by repeating the hexachord pair. The major variation between the row sequence of this section and

Figure 6.11. Tenor Line mm. 74-87 "Surge, aquilo"


R (pc content of hexachords plus final element)
Implied R
pc content only
I1
I8R(A)
8R(A)
I8R(A)
8R(A)
R
Implied R
Implied R
Implied R
Implied R
8 1 5 2 6 4 3 10 11 0 9 8 10 1 3 10 2 11 9 8 10 1 3 10 2 11 9 10 0 3 11 1 2 4 7 5 6 8

that of the first is the replacement of P_0R with I_1. As indicated in the figure, P_0 and I_1 produce a retrograde relationship with regard to pc content but not to ordering. The relationship between these rows is illustrated in Figure 6.12. The initial and final elements

Figure 6.12. Similarities between P_0 and I_1



(pcs 8 and 9) are retained in a retrograde relationship. The only other similarity within this row pair is the preservation of two pc pairs (pcs 5-7 and 10-0). This row pair, then, is not ambiguous like the pair from the second section.

Comparing the three sections of the tenor line, we find that all three are implied retrograde relationships on the largest scale, due to the inclusion of the implied retrograde hexachord pair in the centre of each section. What differentiates these sections is the relationships between the twelve-note rows. The relation in the first and third sections is retrograde, although the hexachordal pc content occurs as ordered sets in the first section and as unordered sets in the third section. The relation between twelve-note rows in the central section is, on the whole, implied retrograde, although there is ambiguity with elements of prime relations in the ordering of the hexachords.

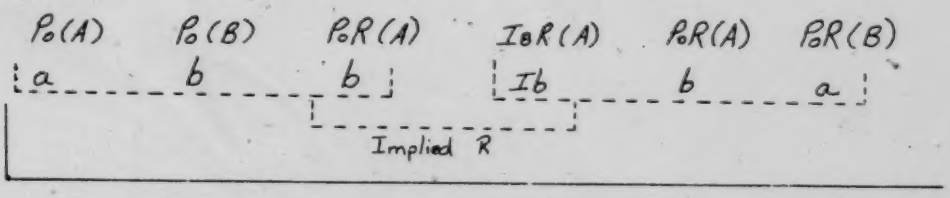
An interesting pattern of pc sets is formed throughout the tenor

Figure 6.13. Pc Sets in Tenor Line of "Surge, aquilo"

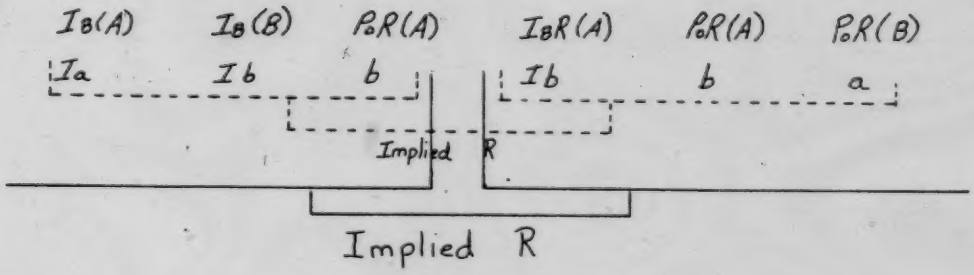
Legend

a = pc content of $P_0(A)$	{2,4,5,6,7,8}
I_a = pc content of implied retrograde of $P_0(A)$	{4,5,6,7,8,10}
b = pc content of $P_0(B)$	{9,10,11,0,1,3}
Ib = pc content of implied retrograde of $P_0(B)$	{9,11,0,1,2,3}

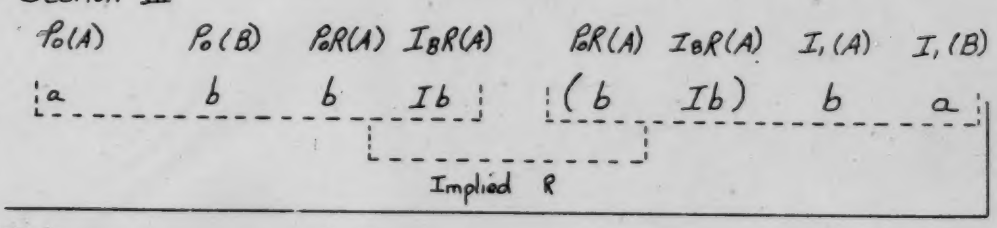
Section I



Section II



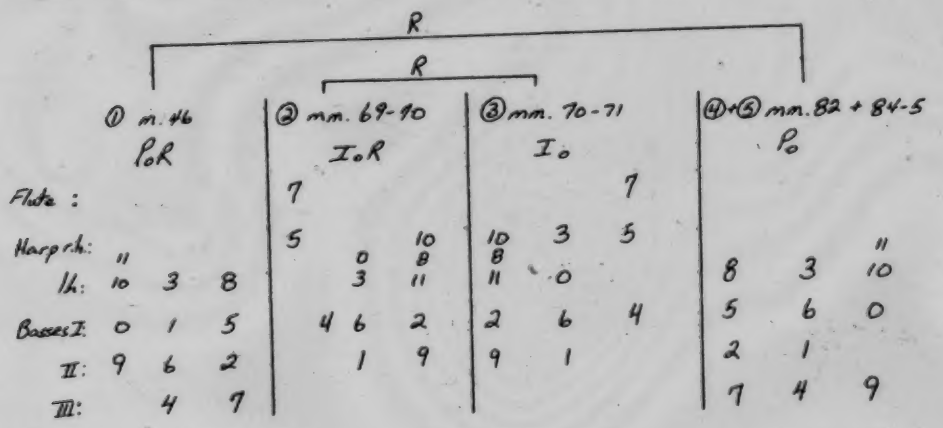
Section III



line of this movement (see Figure 6.13). With the exception of the repeated hexachord pair in the third section, it can be seen that each section contains one hexachord a, either exact or implied, two hexachord b's, either exact or implied, and the retrograde of the entire structure. Also, with the exception of the hexachordal extension in the third section, the entire movement is an implied retrograde, with the focal point in the centre of the second section. The symmetry is disturbed by the hexachordal extension of the final section.

The overall symmetry (retrograde) within this movement is supported by the chordal accompaniment, for harp and three solo basses in harmonics. This is Stravinsky's first use of dividing a complete series to generate vertical sonorities. There are a total of five chordal sections which are diagrammed in Figure 6.14. The verticaliza-

Figure 6.14. Chordal Sections of "Surge, aquilo"



tions of P_o and P_oR consistently divide the row into tetrachords, while in the I_o and I_oR chords, the segmentation consists of three-, four- or five-note collections. The chordal sections are symmetrically placed with the I_oR-I_o sequence occurring at the midpoint of the movement

(mm. 69-71) and both halves represent an exact retrograde relation, with slight variations in voice leadings. This relationship supports the overall structure of the tenor line, except that the focal points do not coincide. The second half of both structures is extended in length, with the tenor line being extended by the repetition of the hexachord pair and the chordal structure being extended by the repetition of the P_o series. The segments of the series used for vertical structures contain the same number of notes as all invariant segments.

Although the tenor line is easily discernible in a ternary structure, an underlying retrograde relationship encompassing the entire movement has been noted, which is supported by the chordal sections. The remainder of the accompaniment, however, supports the ternary division of the tenor line. In each of the three divisions, the accompaniment initially is restricted to one instrumental line which shares minimal invariance with the solo line. Minimal invariance, in this case, involves the retention of either initial or final hexachord elements or the preservation of one or two pc segments. The level of invariance increases throughout the duration of each section and progressively increases from the end of one section to the end of the next. The end of the first section (mm. 52-55) states the same row in the solo and accompaniment (P_o R). The accompaniment increases to two lines at the end of both the second and third sections. The conclusion of the second section (mm. 69-73) states P_o, I_o and I_oR, which hold two four-note segments invariant (pcs 10, 0, 1, 3 and 1, 3, 6, 4). The conclusion of the third section (mm. 86-93) illustrates

the most intricate pattern of invariant segments within this movement and is diagrammed in Figure 6.15. This section produces maximal invariance of ordered segments (three three-note segments in the same order positions) and holds two four-note segments invariant (pcs 10, 0, 3, 1 and 11, 9, 10, 0). The two rows of the solo line have combinatorial possibilities but, because of the presentation, a retrograde relationship is produced with regard to pc content but not to ordering. Three rows, I_1, I_9 and I_5, form a rhythmic canon which is the only canonic section within this movement.

The ambiguity created early in the movement between the hexachord pair is satisfactorily resolved in this concluding section. The pair of pcs which are the most flexible throughout the work are 10, 0 and 0, 2. The pc pair 10, 0 appears in all four rows of this final section, in ordered format. This pair is also a subset of all three- and four-note invariant segments presented and the hexachord containing this pair is the last one stated in the solo line. The ambiguity between hexachords is, therefore, clearly resolved in favor of the hexachord 3, 1, 10, 0, 11, 9.

Structural ambiguity, however, remains throughout the movement. Retrograde relationships, first noted on the local level of the hexachord pair, is extended to define the structure of each section within the tenor line and further extended to influence the solo line of the entire movement. This large retrograde structure is supported by the same structure in the chordal passage (see Figure 6.16). The ambiguity arises from the retrograde structure, which divides the movement into two sections, and the obvious three-part divisions of the solo line,

Figure 6.15. "Surge, aquilo" mm. 86-93

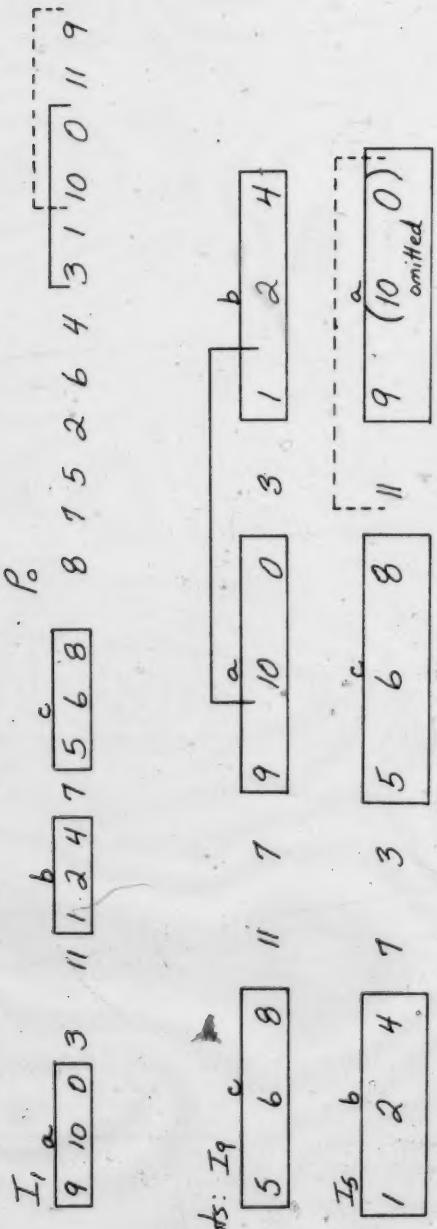
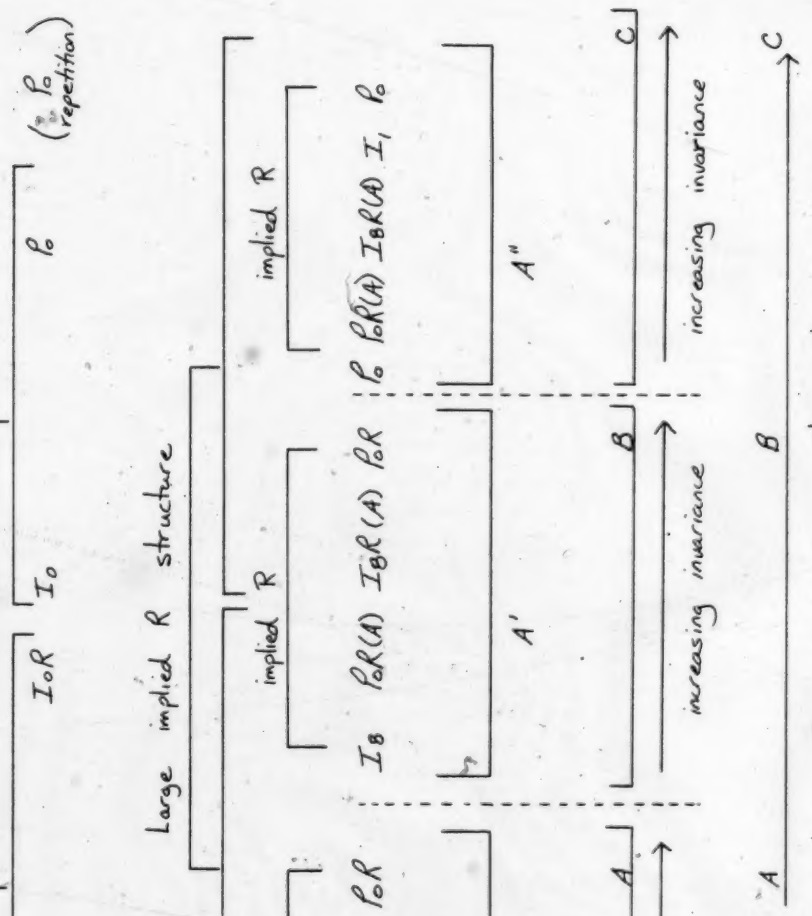


Figure 6.16. Structural Ambiguity in "Surge, aquilo"

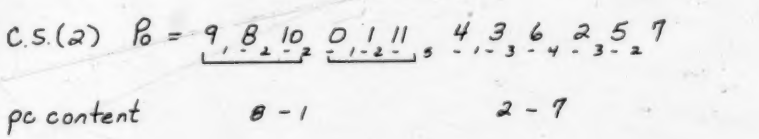


which is supported by the linear accompaniment and its increasing levels of invariance.

"Ad Tres Virtutes Hortationes"

This movement is divided into three submovements, "Caritas", "Spes" and "Fides" and utilizes the second twelve-note series (C.S.(2) see Figure 6.17). Each hexachord contains all the chromatic pcs within an ic 5 (a structural technique used in several earlier works, but this ic was only used in the first of Three Songs). As a result of the pc content of the hexachords, they are identical under the operations inversion and transposition. This is an example of what Babbitt terms an all-combinatorial set.[2] Combinatorial possibilities exist, then, for sets related by all tramsformations (prime, inversion and retrograde inversion). This results in a large number of available combinatorial relations which are utilized throughout this movement (particularly in "Spes").

Figure 6.17. Series used in "Ad Tres"



The ic pattern 1-2 is stated twice in the first hexachord and the pc segments are identical under inversion at t=3 (pcs 9, 8, 10 and 0, 1, 11). As a result of this structural technique, rows related by t=3 or its complement, t=9, or inversion at t=0, t=3 or t=6 hold at least one unordered three-note segment invariant.

Rows which either retain the same hexachordal pc content or hold

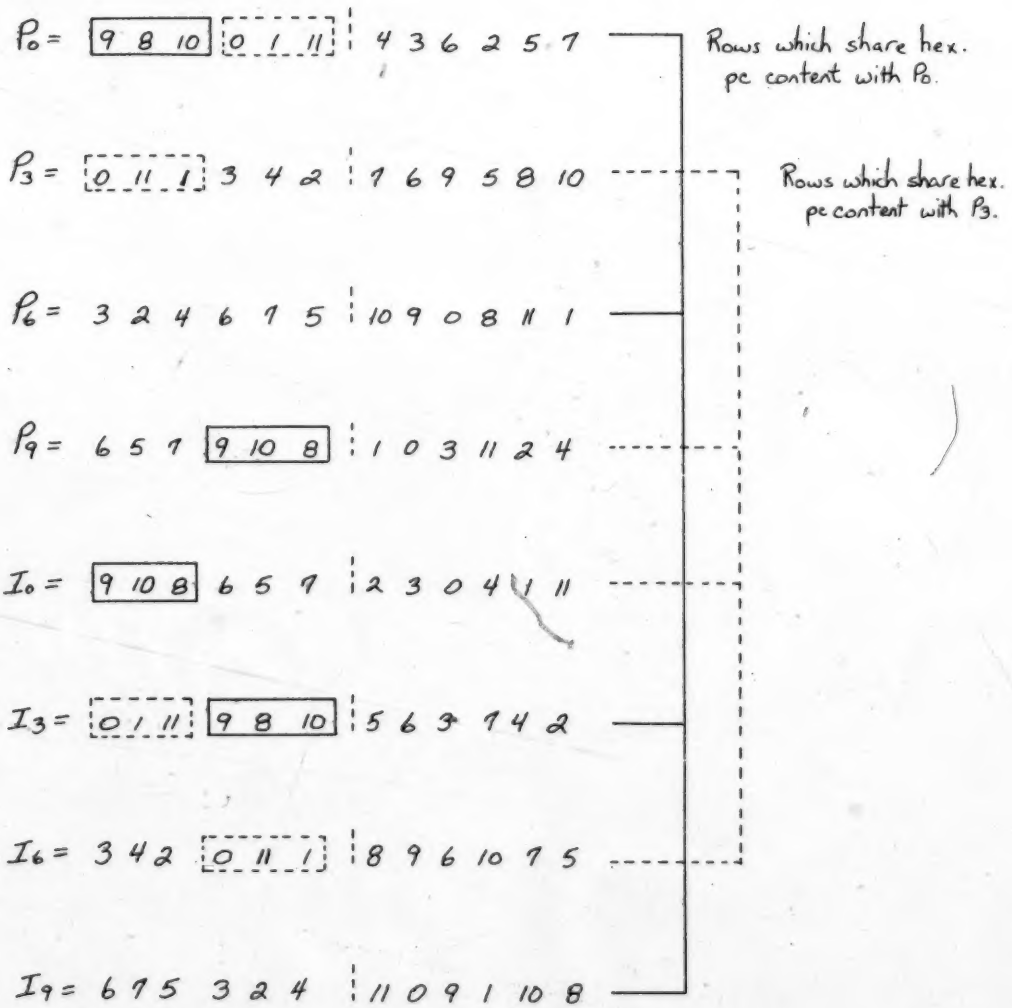
one three-note segment invariant with P_0 are shown in Figure 6.18, and will be referred to as a row group. A row group, then, is composed of eight rows, which are all related by transposition levels of multiples of three. Within a row group, there are two subgroups, each consisting of four rows, which share hexachordal pc content. The possibility exists between any pair of rows from a subgroup to form aggregate or secondary sets. Of the two three-note segments from any row, at least one segment appears in five other rows. Even higher levels of invariance occur between row pairs which retain hexachordal pc content and hold both three-element segments invariant. There are four such row pairs within a row group (P_0 -I_3, P_3 -I_6, P_6 -I_9 and P_9 -I_0). In addition to the row group shown in Figure 6.18, there are two others, the row group of P_1 and the row group of P_2. Row groups play an important role in the structure of this movement and they will be referred to as the row group of P_0, etc.

Each of the three submovements begin with an organ series in a passacaglia rhythm. The transposition level varies with each occurrence of the passacaglia, P_0 at the beginning of "Caritas", P_3 in "Spes" and P_2 in "Fides." This organ passacaglia provides continuity among the submovements. Continuity is achieved within each submovement by the reiteration of the rhythmic figure associated with the passacaglia introductions.

"Caritas"

"Caritas", the first submovement, is a binary structure (AB),

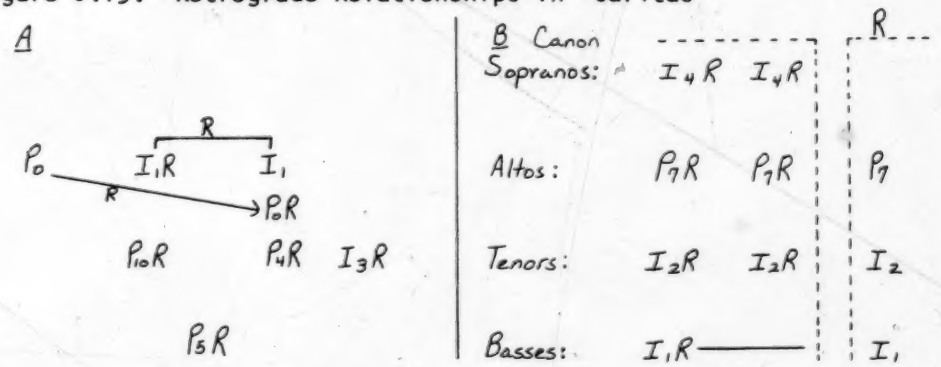
Figure 6.18. Row Group of P_0



with the B section being a canon for three-part chorus and trumpet in augmentation, while the A section is in a fuller contrapuntal texture.

Retrograde relationships became structurally significant throughout "Surge, aquilo" and they prove to be important in "Caritas" as well. The serial statements of "Caritas" and the retrograde relationships are shown in Figure 6.19. The A section contains only

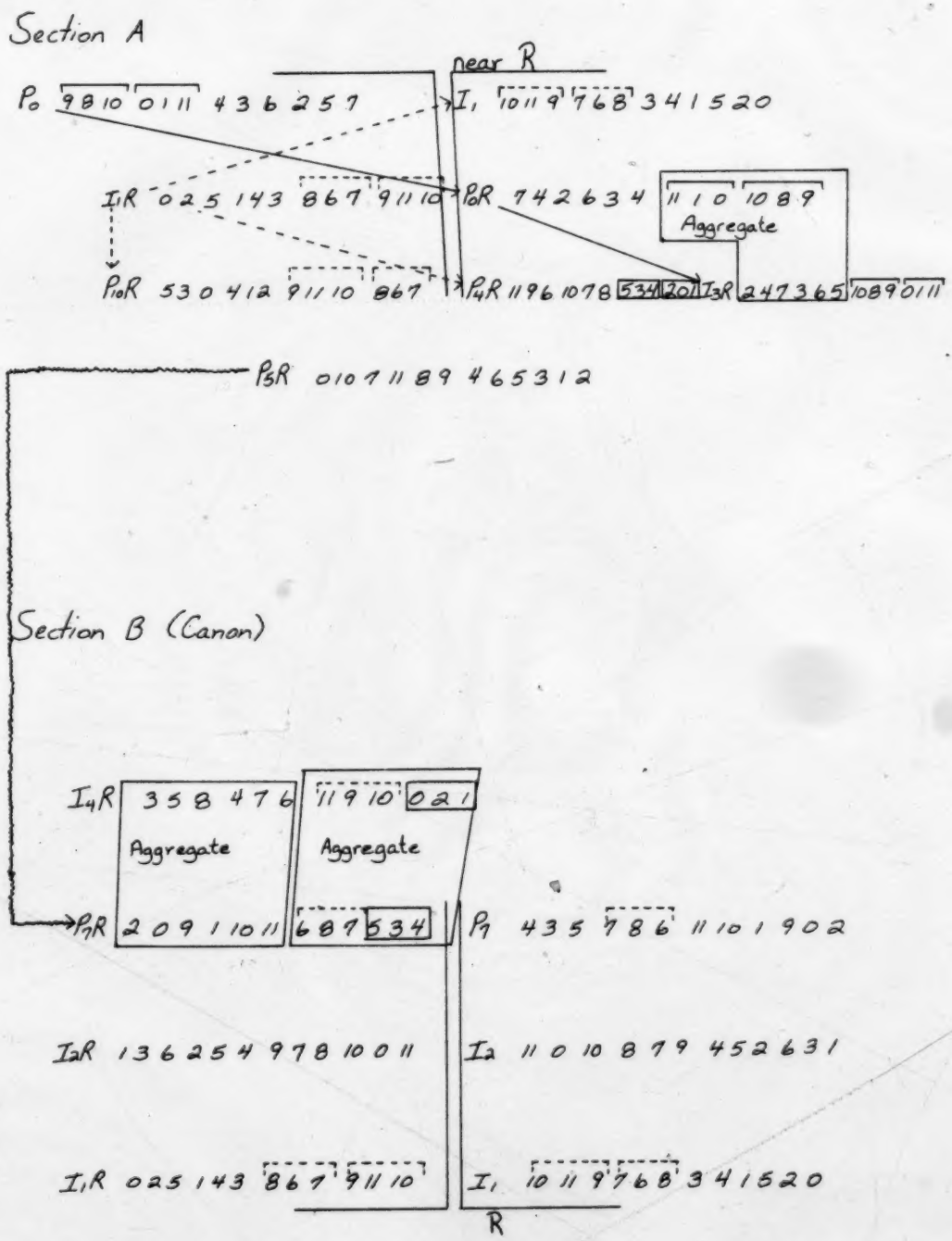
Figure 6.19. Retrograde Relationships in "Caritas"



two retrograde relationships, which, it is admitted, are obvious and rather superficial. In all voices, except the soprano, retrograde relationships are evident. The altos and tenors each state a retrograde row twice and its associated prime row once. Because of augmentation, the trumpet has time to state only the retrograde row and its prime once. The soprano, the last voice to enter the canon, has time to state only the two retrograde forms and omits the associated prime (which would be I_4). The entire B section is repeated with a new text to bring "Caritas" to a close.

The use of row groups throughout "Caritas" is shown in Figure 6.20. The A section can now be seen to be symmetrically arranged

Figure 6.20. Row Groups Throughout "Caritas"



around P_5R, the focal point. The remainder of the series come from two row groups, the row group of P_0 and that of P_1. It should be noted that members of the same row group situated on the same side of the focal point have prime relationships of hexachordal pc content, while the hexachordal content of those situated across the focal point are retrograded. Within each row group, there are three rows stated which, in addition to the hexachordal pc invariance, also retain both three-note segments. Two of these rows from the second row group (I_1R, $P_{10}R$) occur in the first half, while two from the first row group (P_0R, I_3R) occur in the second half. Although the possibility for aggregate sets exists, only one appears between the last hexachord of P_0R and the first hexachord of I_3R. P_5, alone, shares no invariance with other rows and, thus, functions as the focal point of the symmetrical retrograde structure of the A section.

Retrograde relationships in each voice except soprano are a major feature of the B section. It is interesting that the initial elements of rows in this section span a tritone (pcs 10-4) and their arrangement produces a chromatic spreading out from the first pc stated (pc 1).[3] Of the four initial rows stated in this section, only one, I_1R, has previously been stated. Each of the three-note segments of I_1R are held invariant in one simultaneous row (pcs 8, 6, 7 in P_7R and pcs 9, 11, 10 in I_4R). Further, these two rows, P_7R and I_4R, contain identical hexachordal pc content and their arrangement produces two aggregate sets. The second three-note segment of both P_7R and I_4R are held invariant with P_4R of the A section (the only row in the first section which held hexachordal pc content invariant

but not three-note segments). The row not related to others in the B section, I_2R, shares hexachordal pc content with P_5R, the focal point and only row lacking invariant relationships with other rows in the A section.

Each section of "Caritas" utilizes retrograde relationships and invariant relations bind the two sections together in a very logical way. There are three row groups utilized in this submovement and each is utilized in a different way. The row group of P_0 is represented by three serial statements, which all occur in the A section. Further, all three rows (P_0, P_0R and I_3R) retain both three-note segments and hexachordal pc content. The row group of P_2 is represented by two serial statements and is the only group which does not display invariance of three-note segments. Additionally, although both sections contain rows from this group, these rows do not share invariant characteristics with other rows of each section. The row group of P_1 is represented by seven serial statements and receives the most extensive development of any row group in this submovement. Within the A section, four rows are stated from this group and three of them have invariant three-note segments. The fourth row (P_4R), although maintaining hexachordal pc content, does not retain three-note segments from the other rows. In the continuation of this row group in the B section, each of the three-note segments of P_4R occur in a new row (I_4R and P_7R). The alternate three-note segments from these two rows are the segments from I_1, which was stressed throughout the A section and recurs in the trumpet part of the B section.

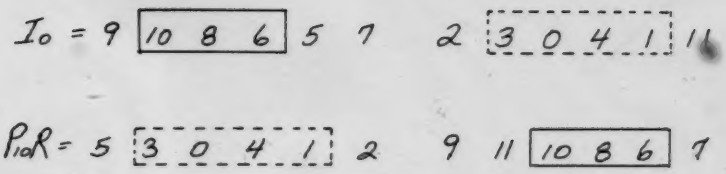
"Spes"

"Spes", the central submovement, is the focal point of the retrograde structure of the entire work. The form of "Spes" can be represented as: Introduction ABAB'A. The A sections are scored for tenor and baritone soloists and brass, while the B sections are scored for choral sopranos and altos, oboes and trombones.

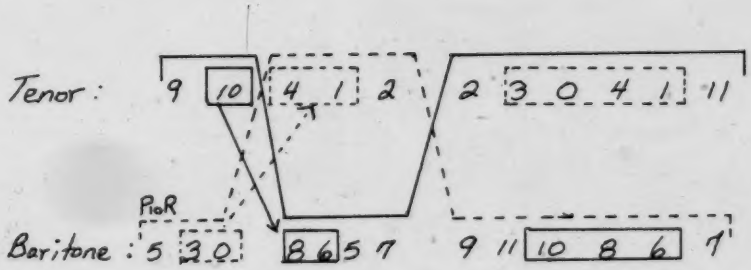
Within each section, a high degree of invariance is displayed between certain rows. In the A section, this characteristic involves two rows, I_0 and $P_{10}R$, in the tenor and baritone (see Figure 6.21). These rows hold two ordered segments invariant, one with three elements and the other with four. This is a unique relationship and appears only in these sections of the work. The arrangement of these statements is such that each is divided between the soloists and each changes lines twice. When each row returns to its original voice, it is at the beginning of the second hexachord. Because of the alternations of voicings, the first occurrence of invariant segments are split between two voices, while in the second appearance, they remain in one voice. The prominence of simultaneous invariant segments is emphasized by the indication of 'subito piu f' and accents in both vocal lines at their second appearance. We find, then, that both the invariant segments and hexachordal divisions are brought out in the setting of this passage.

The accompaniment in the A sections consists of only two rows, P_5 linearly in the trombones and a vertical statement of P_2. These rows share only an unordered three-element segment (pcs 1, 2 and 3)

Figure 6.21. Serial Statements and Arrangement in A Sections of "Spes"



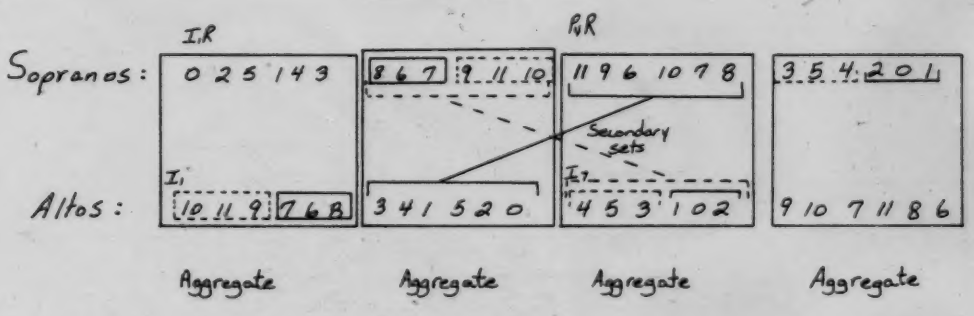
Arrangement



and neither row is significantly related to either vocal series. Because of the distribution of the vocal series, however, the invariant segment from the accompaniment does appear linearly in the tenor line (see Figure 6.21). The occurrence of this segment in the tenor line adds coherence both to the vocal alternations of their series and the use of these two accompanimental rows.

Within the B sections invariance is based on the similarity of hexachordal pc content, that is, on one row group. The serial statements of the choral sopranos and altos of the B section (mm. 154-168) are diagrammed in Figure 6.22. The structure, here, is based on

Figure 6.22. Choral Series of Section B "Spes"



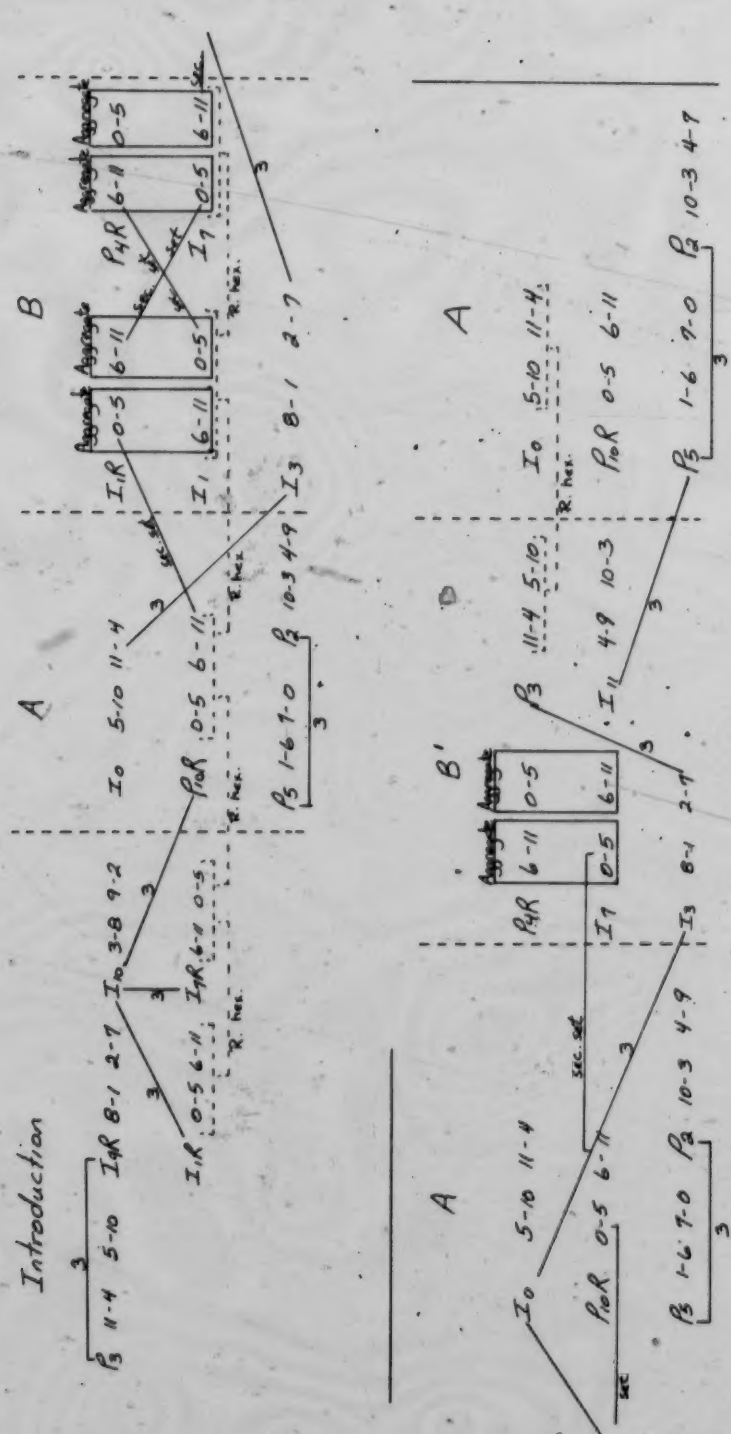
secondary and aggregate sets, with two secondary sets being formed and four aggregate sets. Each pair of simultaneous rows hold both three-note segments invariant in retrograde order. This passage reflects the maximal use of combinatorial principles throughout the work. Accompanying this choral passage is I_3 (in oboes and trombones), which shares no invariant relationships with any of the choral rows.

The B' section (mm. 169-177) begins with the last row pair of the B section (P_4 R and I_7) and, therefore, retains the same relation-

ships. The continuation, using P_3 and I_{11}, does not continue the relationships. These two rows do not contain the same hexachordal pc content or any invariant segments. I_3, the accompanimental row, does, however, contain an invariant ordered segment with P_3 (pcs 11, 0, 1).

Figure 6.23 shows the use of row groups throughout "Spes." From an examination of this figure, more significant characteristics become evident. From this example, we can see that two row groups predominate, the row group of P_0 and that of P_1. Both row groups are sounded almost continuously throughout the submovement, while the row group of P_2 is restricted, for the most part, to the A sections. The statements utilizing the row group of P_1, in all but one instance (I_{10}), share the same hexachordal pc content and result in the production of secondary and aggregate sets. A notable exception to this is in the introduction and initial A section. Here, the arrangement of rows is I_1R, I_7R and $P_{10}R$, which produces retrograde placement of hexachords. In addition, this is the point where I_{10} is stated, which shares one three-note segment with each of the other three rows. The rows utilized from the row group of P_0, in all but one case (P_3), retain only one three-note segment. At the conclusion of the submovement, the row pair P_3-I_0 occurs. This row pair retains hexachordal pc content, arranged in retrograde order, but does not hold any three-note segments invariant. This is the only row pair from this row group that does not contain three-note segment invariance. It is interesting that where the oddities in row group usage occur, there is only one main row group being stated

Figure 6.23. Use of Row Groups in "Spes"



and it takes over the usual usage of the other main row group. The usage of the row group of P_2 is restricted to the use of two rows in the A section (P_5 and P_2), which share one three-note segment. In the last occurrence (B' section to final A section), the row group is extended to three rows, I_{11}, P_5 and P_2. In this sequence, each pair of rows hold a three-note segment invariant and supplies the invariance missing in the simultaneous rows from the row group of P_6.

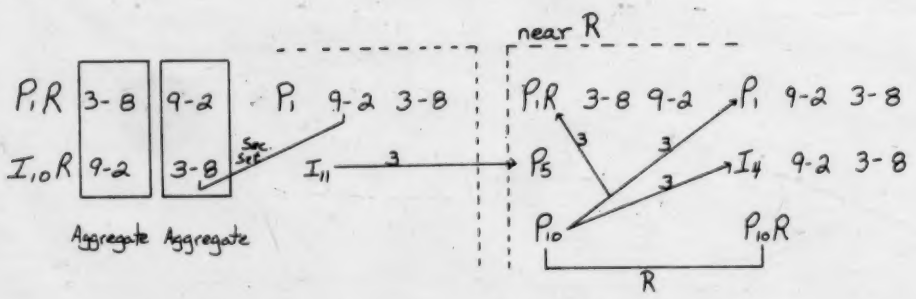
"Fides"

"Fides", the third and final submovement of "Ad Tres", is a binary structure (AB). The B section is a six-part canon for four-part chorus, trumpet and contrabass trombone in octaves and oboe and bass trombone at three octaves, while the A section is in a freer contrapuntal texture.

Throughout the A section (mm. 189-218), there are four linear statements of P_1 or its retrograde, with the first and third statements in the instrumental parts (P_1R) and the second and fourth appearances in the four-part chorus in octaves (P_1). This sequence represents retrogression of the initial row pair (P_1R-P_1). All the serial statements from the A section are given in Figure 6.24. From this figure we find that there are eight serial statements from the row group of P_1. There are two series which have the same hexachordal pc content as P_1, $I_{10}R$ and I_4. The placement of these two rows supports the retrograde placement of the P_1-P_1R sequence by being simultaneous with the first and fourth elements of

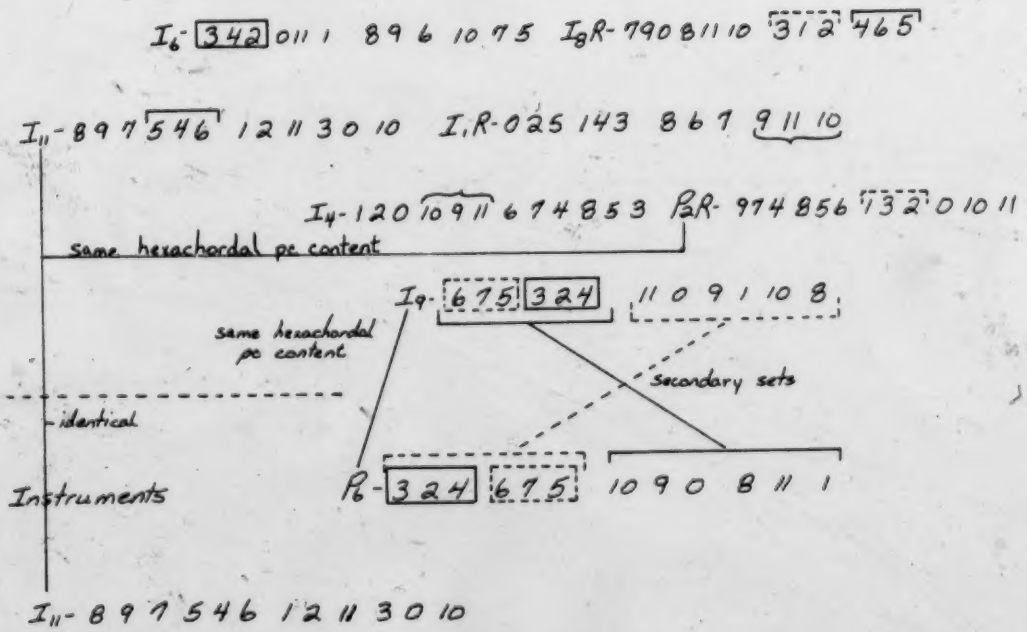
Figure 6.24. Use of Row Groups in "Fides"

Section A



Section B (Canon)

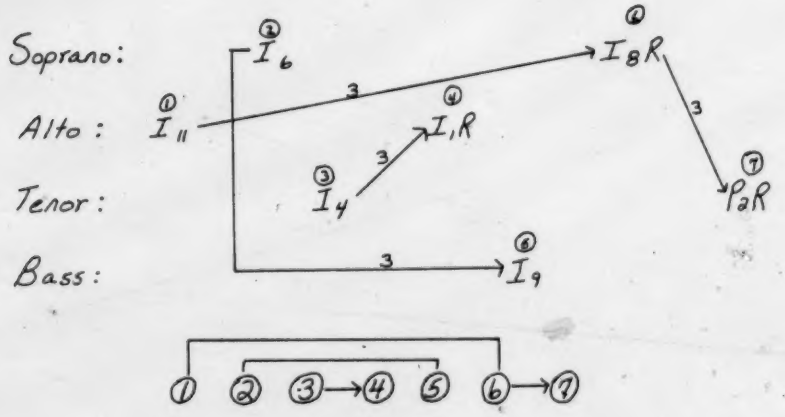
Chorus



the sequence. The combination of P_1R and $I_{10}R$ forms two aggregate sets, while the hexachordal pc contents of P_1 and I_4 are identical and, therefore, do not produce aggregate sets. The symmetrical structure is upset by the inclusion of P_{10} and $P_{10}R$ in the second half of the section. This row pair imitates the exact retrograde of the P_1R-P_1 pair and shares a three-note segment with all other rows from the row group of P_1. The symmetrical structure is further strengthened by the inclusion of one row from the row group of P_2 in each half of the section and these two rows (I_{11} and P_5R) hold a three-note segment invariant.

Within the canonic B section, the choral lines use the rhythm of the organ passacaglia, while the instrumental lines are augmented, sounding one note per measure. The serial statements used in the B section are shown in Figure 6.24. Each of the instrumental rows shares the same hexachordal pc content with a choral series. The second instrumental row, P_4, shares both hexachordal pc content and two three-note segments with I_4 in the basses. The arrangement of these rows is such that the three-note segment 6, 7 and 5 occurs simultaneously in both rows and secondary sets are produced between the first hexachord of each row and the second hexachord of the other row. The two instrumental lines have no invariance between themselves. There are a total of seven serial statements in the choral canon and only three-note segment invariance is utilized. The order of entries and rows sharing three-note segments are shown in Figure 6.25. From this example, we see a symmetrical structure with the third and fourth entries being the focal point and

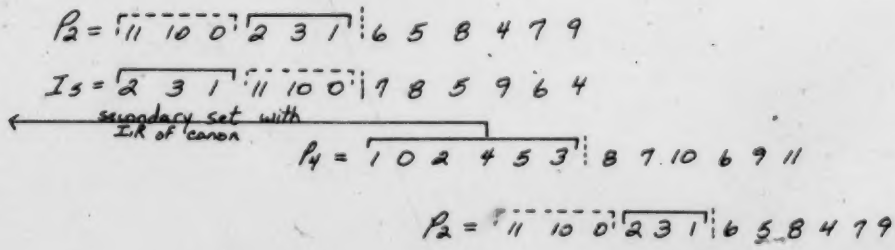
Figure 6.25. Choral Canon of "Fides"



retrograde relationships spreading out from this point. The final row, P_2R, is not part of the symmetrical structure but does share a three-note segment with I_8R and hexachordal pc content with I_{11}. Again, with the exclusion of P_2R, the serial statements of the choral canon are arranged in pairs whose initial pcs are related by ic 5 (I_{11}-I_6, I_4-I_9, I_1R-I_8R). The initial pcs of the instrumental rows are also related by ic 5.

The conclusion of "Fides" is illustrated in Figure 6.26. In

Figure 6.26. Conclusion of "Fides"



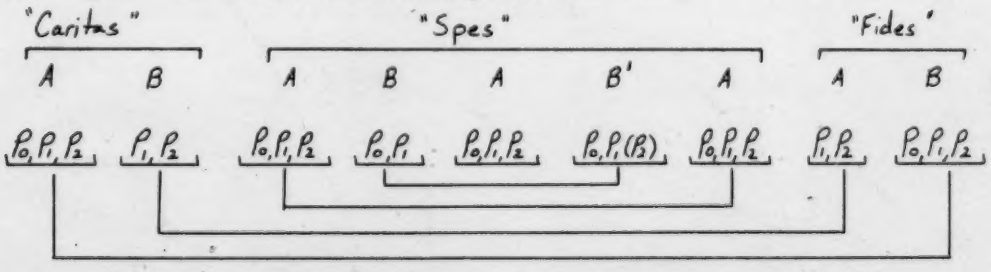
this section, three rows from the row group of P_2 are stated. P_2 and

I_5 retain both hexachordal pc content and both three-note segments, but their arrangement does not produce aggregate sets. P_4, the only row from the row group of P_1, does produce a secondary set with I_1R, a concluding row from the choral canon.

Throughout "Fides", the row groups of P_1 and P_2 occur in each section, while the row group of P_0 is restricted to the B section. Within each row group there is one pair of rows which shares both hexachordal pc content and two three-note segments; P_1R-I_4, P_6-I_9 and P_2-I_5 which occur in section A, section B and the conclusion respectively. Each of these row pairs occurs simultaneously and in each case prime relationships are formed between hexachords.

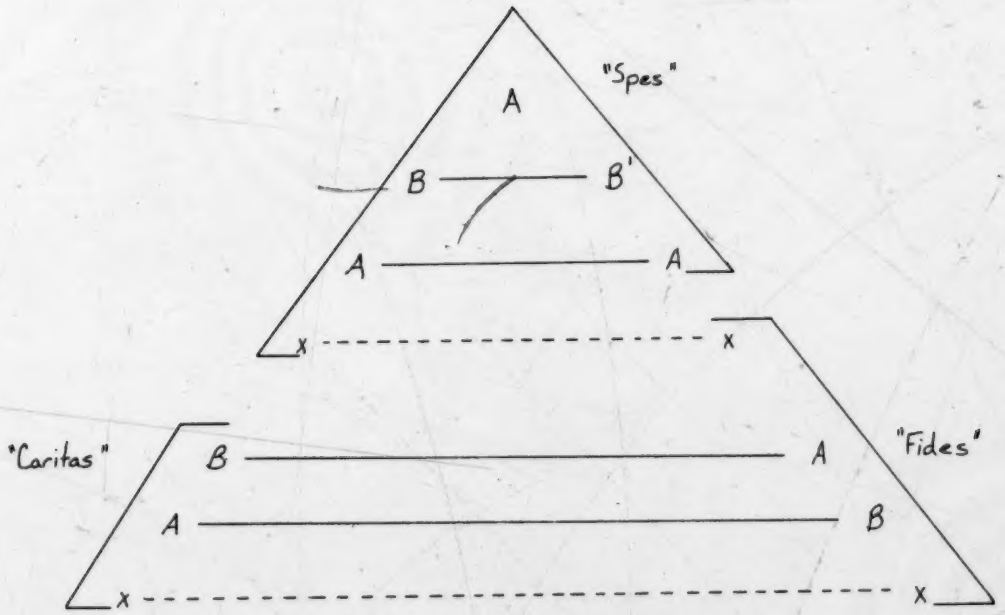
The movement has a symmetrical structure as substantiated by the return of the passacaglia in the final measures (see Figure 6.27).[4] This structure is based on large formal structures within each submovement. More significant relationships emerge if we consider structural characteristics within each submovement and section. Throughout this movement we find the use of row groups within each section supports a symmetrical structure (see Figure 6.28).

Figure 6.28. Row Groups used throughout "Ad Tres"



All three row groups are used in each submovement, but within some sections only two row groups are utilized. Sections with only two row

Figure 6.27. Symmetrical Structure of "Ad Tres"



x= organ passacaglia

groups are symmetrically placed; P_1 and P_2 in B of "Caritas" and A of "Fides", and P_0 and P_1 in B and B' sections of "Spes" (although there is one row from the row group of P_2 in the B' section). The type of invariance characterized by each group is variable except in "Spes", where the row group of P_0 consistently involves the retention of one three-note segment and the row group of P_1 is consistently involved with preserving hexachordal pc content and the production of aggregate and secondary sets.

The outer movements are similar in a number of ways. Both "Caritas" and "Fides" are binary structures (AB) and in both sub-movements the B section is a canon. The organization of the canons, however, is different. The canon of "Caritas" involves only two row groups and includes retrogression within each line. The initial pcs of this canon spread out chromatically from the first pc (pc 1) to form a chromatically-filled ic 6. The canon from "Fides" involves three row groups and although a retrograde structure is presented, it is not produced within each line. The initial pcs of this canon are arranged in pairs related by ic 5. The A sections of both these submovements are similar in their basic retrograde structure, although in each submovement the second half of the A section contains additional material which throws the symmetry out of balance.

The central submovement "Spes" is unique in its multi-sectional structure. Additional unique characteristics are the use of invariance of internal pc segments within the A sections and the concentration on combinatorial possibilities in the B sections. "Spes" is also the focal point of the entire work and these unique

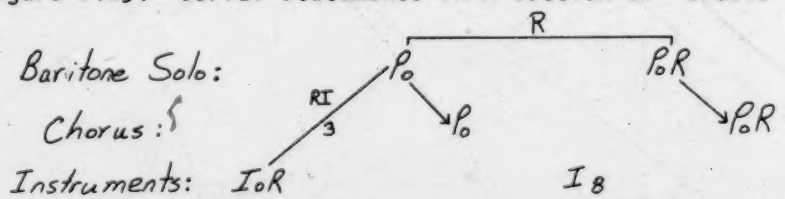
characteristics heighten this function of the submovement.

"Brevis Motus Cantilenae"

"Brevis Motus Cantilenae" is the fourth movement of Canticum Sacrum and the final one using a twelve-note row. The movement uses the C.S.(2) series and is in ternary structure (ABA'). The A sections are scored for baritone solo, chorus, oboe, bassoons, trumpets, trombones, violas, basses and organ, while the B section is for chorus acappella.

The initial section is very simple in structure and is diagrammed in Figure 6.29. The statements of the baritone solo are

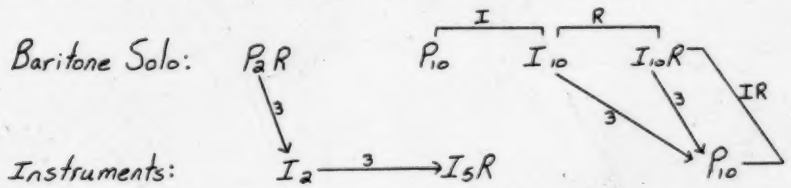
Figure 6.29. Serial Statements in A Section of "Brevis"



echoed in the chorus in octaves and the two statements form a retrograde structure. Though there is no similar structure in the instrumental row pair, I_oR holds a three-note segment invariant with P_o and P_oR. Further, the relationship between I_oR and P_o is that of untransposed retrograde on the inversion. The second instrumental row, I_8, does not share pc invariance with the other rows of this section.

The A' section contains seven serial statements and is shown in Figure 6.30. This section is based on two groups of rows which share three-note segment invariance. The first group, P_2R-I_2-I_5R,

Figure 6.30. Serial Statements of A' Section of "Brevis"



all hold the pcs 10, 11 and 0 invariant, while the second group, P_{10}-I_{10}-$I_{10}R$, all hold the pcs 6, 7 and 8 invariant. In addition, all the rows from the second group are at the same transposition level and, therefore, untransposed relations of inversion, retrograde and inversion of the retrograde are present.

The B section is a four-part choral canon and is diagrammed in Figure 6.31. All voices are in rhythmic canon and there are a total of six serial statements. There are two pairs of rows which are exact retrogrades ($I_{10}R$-I_{10}, P_5R-P_5). The former pair occurs in the tenor, while the latter pair is split between the bass and soprano. The alto line has two serial statements which share hexachordal pc content and their arrangement produces a retrograde relationship between hexachords. In addition, each row of the alto line holds one three-note segment invariant with both tenor rows.

If we consider the use of row groups throughout this movement, we find that all three row groups are utilized (see Figure 6.32). The row group of P_0 is used only in the A section, the row group of P_1 is used in the B and A' sections and the row group of P_2 is found in all three sections. The row groups of P_0 and P_1 are used in similar ways with adjacent row pairs each producing untransposed relations regarding the entire series. The use of the row group of

Figure 6.31. Serial Statements of B Section of "Brevis"

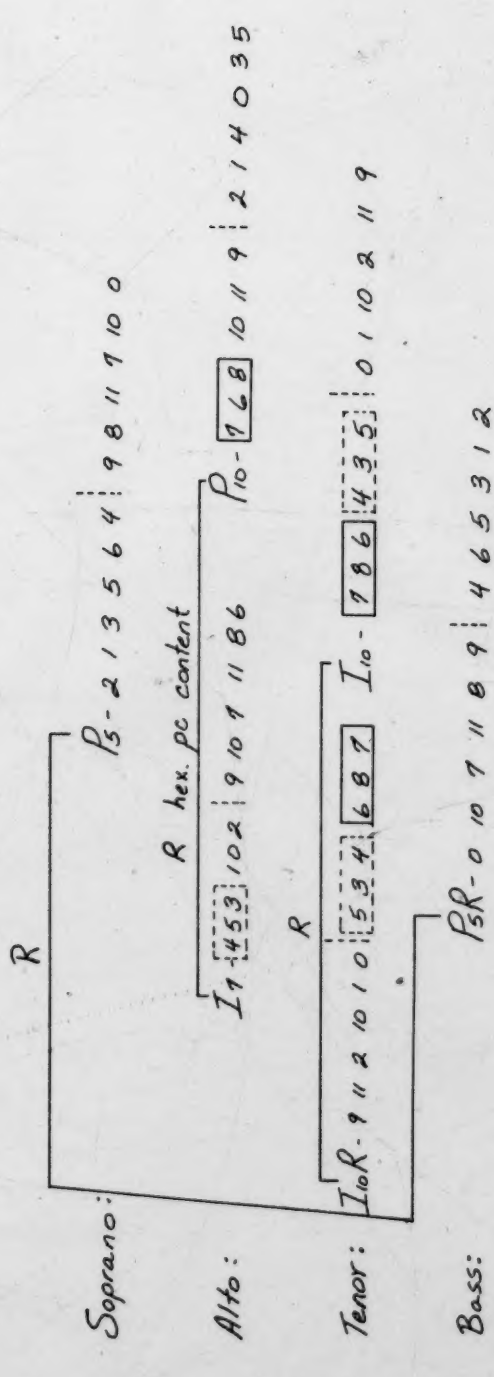
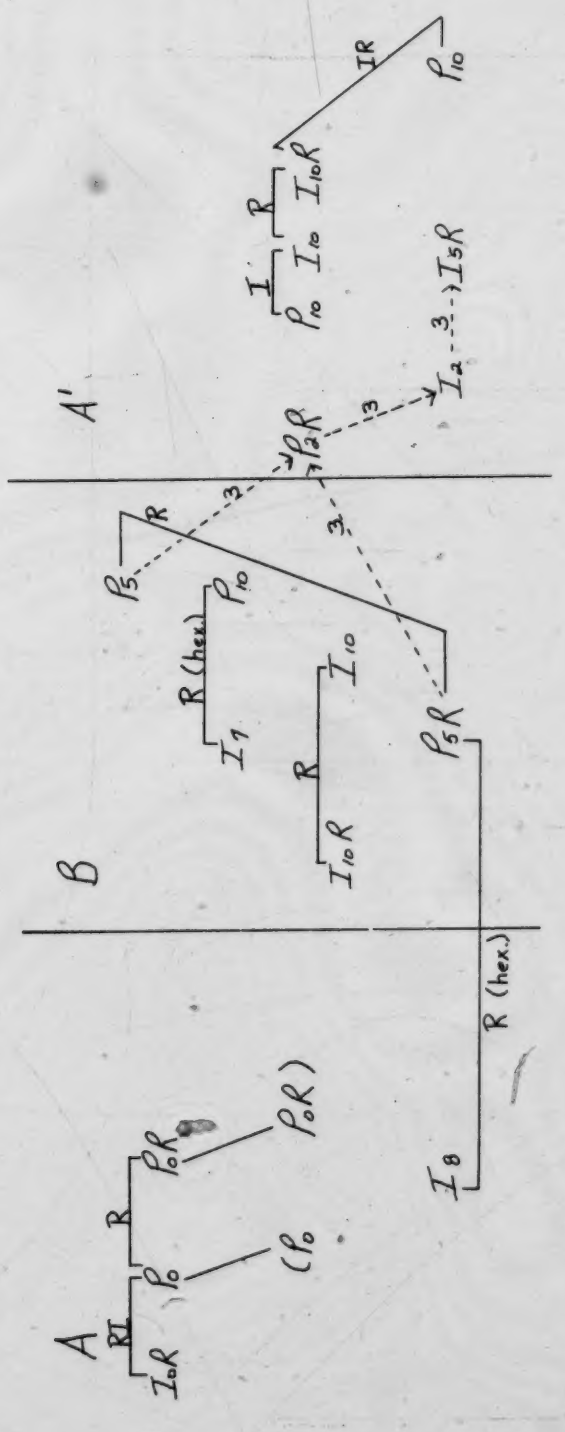


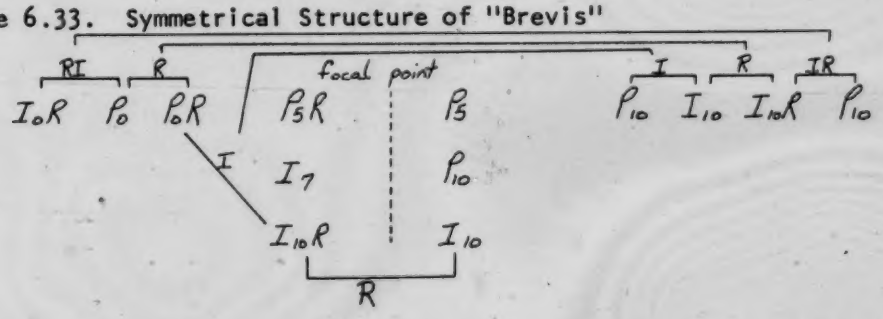
Figure 6.32. Row Groups in "Brevis"



P_2 is to initially juxtapose rows producing untransposed relations. I_8 and P_5R contain retrograde placement of identical hexachordal pc content, while P_5R and P_5 are exact retrogrades. After this point, the rows of this row group each share a three-note segment with adjacent rows. Relationships involving this row group are the only ones which transcend formal divisions.

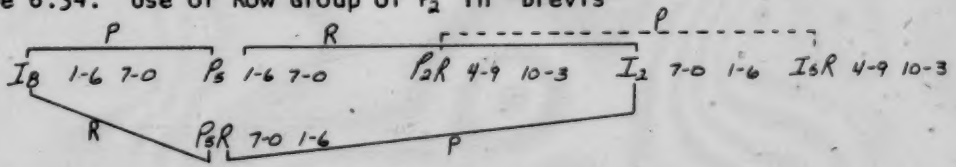
A somewhat symmetrical structure can be seen with the B section as the focal point (see Figure 6.33). Although this dia-

Figure 6.33. Symmetrical Structure of "Brevis"



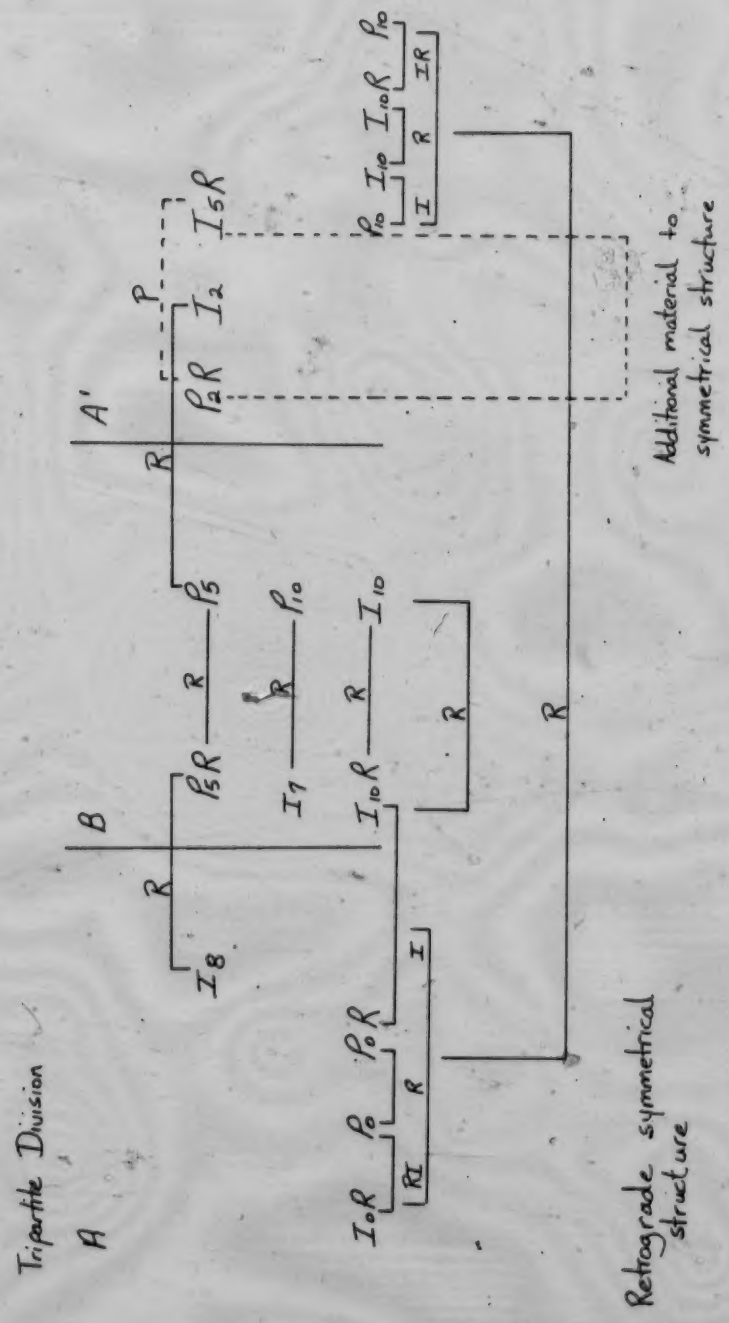
gram accounts for all the material in the B section, only the rows from the row groups of P_0 and P_1 are indicated in the A and A' sections. The structure formed by rows from the row group of P_2 is more complex and is shown in Figure 6.34. The row pair

Figure 6.34. Use of Row Group of P_2 in "Brevis"



P_5 -P_5R form the focal point and one row in each half shares hexachordal pc content with the focal point. The latter half of this structure is extended by the inclusion of the row pair P_2R-I_5R,

Figure 6.35. Ambiguity of Structures in "Brevis"



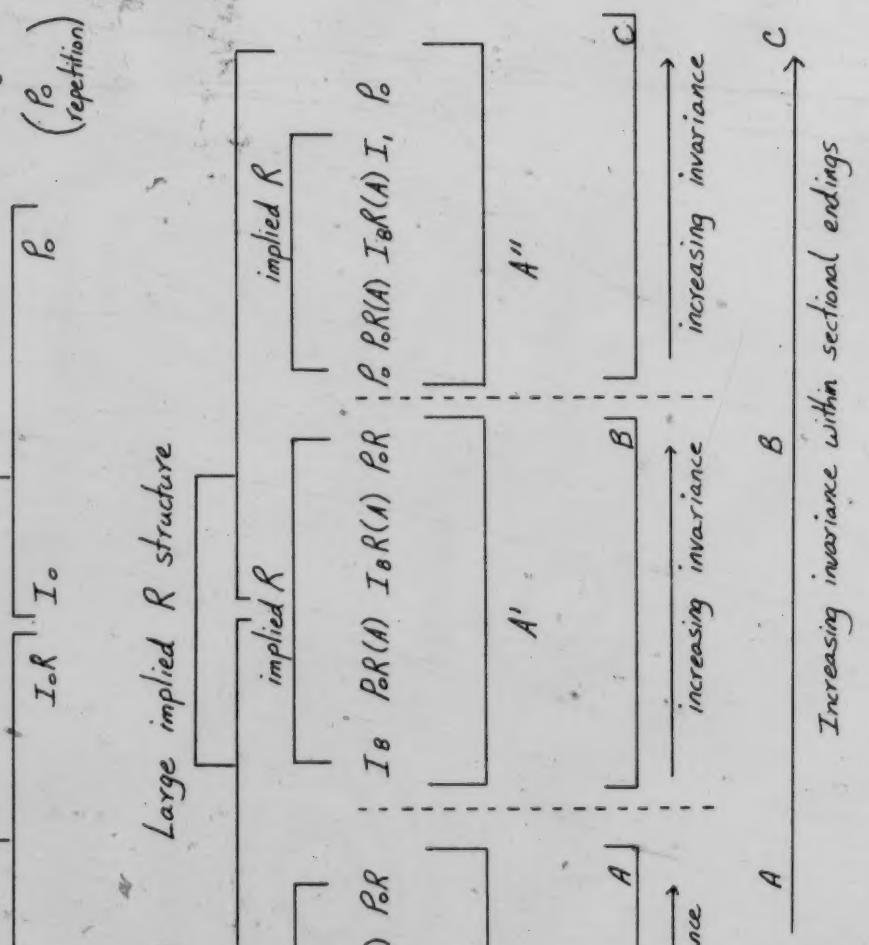
the hexachords of which have a prime relationship. This extension tends to obscure the otherwise obvious symmetrical structure of this movement.

The structure of this movement is rather ambiguous with the obvious tripartite formal divisions and an underlying symmetrical structure, which is obscured by the addition of more material in the second half of the structure (see Figure 6.35).

The structure of "Brevis", with its clear tripartite division and underlying symmetrical structure, is identical to the structure of the second movement, "Surge, aquilo" (see Figure 6.36). "Surge, aquilo" has additional material in the third formal section or second half of the symmetrical structure, which obscures the symmetry, as the same technique does in "Brevis." Although "Surge, aquilo" and "Brevis" use different twelve-note rows, there are several structural similarities between these two movements.

In the opening remarks of this work some observations in regard to symmetry were made. These remarks were limited to the use of chorus, soloists and large structures (such as canonic devices). The ensuing analysis has attempted to substantiate this point by reference to the levels of material used, usage of material and structural characteristics. The entire work is based on retrograde structures, both on the local level of hexachords and twelve-note rows and over increasingly longer spans involving submovements, movements and the work as a whole.

Figure 6.36. Structural Ambiguity in "Surge, aquilo"



NOTES

[1]Robert Craft, "A Concert for Saint Mark's," The Score no. 18 (Dec., 1956), p. 35.

[2]Milton Babbitt, "Set Structure as a Compositional Determinant," Perspectives on Contemporary Music Theory (New York: W.W. Norton and Co. Inc., 1972), p. 135.

[3]J.P. Brantley, "The Serial Choral Music of Igor Stravinsky," (Ph.D. dissertation, University of Iowa, 1978), p. 78.

[4]Ward-Steinman, "Serial Techniques," p. 58.

CHAPTER 7: AGON

Agon, Ballet for Twelve Dancers was the last work, in the group under study, to be completed. Although Agon was begun as early as December 1953, work on it was interrupted by the composition of In Memoriam Dylan Thomas and Canticum Sacrum.[1] As a result of the interruption of the compositional process, this work is one of the most interesting of the group because different phases of Stravinsky's adoption of serial techniques are represented.

The title of the work is of Greek origin and refers to a competition or contest. There is no plot to the ballet other than the idea of a dance competition. The score specifies twelve dancers (eight female and four male) and the movements are based on a variety of groupings of the dancers.

There are twelve movements involving dancers, which are punctuated by nearly-identical instrumental movements, entitled prelude or interlude. These instrumental movements divide the work into four sections, each of which contains three movements for dancers (see Figure 7.1).[2]

The overall structure is loosely symmetrical, with the first and fourth sections using the full twelve dancers and the internal pair of sections using only three dancers each. The second and third sections are also distinguished from the outer sections by their brevity and the use of sectional titles ("First" and "Second Pas-de-Trois").

Figure 7.1. Agon

First Section:	1 "Pas-de-Quatre" (4m)	
	2 "Double Pas-de-Quatre" (8f)	
	3 "Triple Pas-de-Quatre" (8f and 4m)	
Prelude		
Second Section:	"First Pas-de-Trois"	
	1 "Saraband-Step" (1m)	
	2 "Gailliarde" (2f)	
	3 Coda (1m and 2f)	12-tone and nonserial
Interlude		
Third Section:	"Second Pas-de-Trois"	
	1 "Bransle Simple" (2m)	serial (non 12-tone)
	2 "Bransle Gay" (1f)	serial (non 12-tone)
	3 "Bransle Double" (2m and 1f)	12-tone
Interlude		
Fourth Section:	1 "Pas-de-Deux" (1f and 1m)	serial and nonserial
	2 "Four Duos" (1f and 1m)	12-tone
	3 "Four Trios" (1m and 2f)	12-tone and serial (non 12-tone)
	Coda (all dancers)	

The internal pair of sections is situated symmetrically about the central interlude and certain similarities exist between the pair. Already mentioned is that each section utilizes only three dancers. Each movement of these sections utilizes a different number of dancers (1, 2 or 3), and the movement using three dancers occurs at the end of each section. Variety is achieved by the number of each sex, with the second section using one male and two females, while the third section uses two males and one female. The sequence of movements in the second section uses one, two and then three dancers respectively, while the third section uses two, one and then three dancers. The appearance of the sexes is consistent between the sections with males alone in the first movement, females alone in the second and both sexes in the third movement.

There are also symmetrical features between the outer sections of this work. The major similarity is that the last movement of each section employs the full complement of dancers, while the earlier movements use a variety of groupings of less than the total number of dancers.

Also indicated in Figure 7.1 are the movements which contain serially-derived material. The materials utilized in this work are twelve-tone series (indicated by '12-tone' in Figure 7.1), series using less than twelve notes (indicated by 'serial') and nonserial or free material (indicated by 'nonserial'). From these three basic types of material five different combinations are used, some of which have been used in previous works. Two movements contain only material derived from a twelve-tone series, used previously in Canticum Sacrum.

Two other movements contain only material derived from a series of less than twelve tones, which was used throughout In Memoriam. One movement utilizes material from a series of less than twelve notes in combination with free material, which was utilized in the early serial works (Cantata, Septet and Three Songs). Two combinations were not used in previous works; firstly, material from a twelve-tone series combined with free material and secondly, material from two series, one twelve-tone and the other fractional.

There are several different series used within this work, which are shown in Figure 7.2[3], and it is important that each series is confined to one section. This offers further justification for the division of the work in this study. There are three different twelve-note series used and each is used only within one section. Within sections three and four fractional rows are also used and each is related in some way to its twelve-note series. More specific qualities and relationships between rows will be examined at the beginning of each section in which they are used.

Second Section

The second section of Agon, entitled "First Pas-de-Trois", is in three movements; "Saraband-Step", Galliarde and Coda. The coda alone is constructed from a series and our study of this section will be limited to this movement.

The coda is the only movement within this study that combines material drawn from a twelve-note series and nonserial material. The twelve-tone series is shown in Figure 7.3. The ic structure of this

Figure 7.2. Rows used in Agon

Second Section — Coda of "First Pas-de-Trois"

$P_0 = 9\ 11\ 10\ 0\ 1\ 3\ 4\ 6\ 5\ 7\ 2\ 8$ (2 - 1 - 2 - 1 - 2 - 1 - 2 - 1 - 2 - 5 - 6)

Third Section — "Second Pas-de-Trois"

"Bransle Double" $P_0 = \overset{A}{0\ 2\ 3\ 5\ 4\ 9}\ \overset{B}{7\ 8\ 10\ 11\ 1\ 6}$ (2 - 1 - 2 - 1 - 5 - 2 - 1 - 2 - 1 - 2 - 5)

"Bransle Simple" primary row $P_2(A) = 2\ 4\ 5\ 7\ 6\ 11$ (2 - 1 - 2 - 1 - 5)

subsidiary row[4] $S.P_0 = 2\ 0\ 7\ 5\ 1\ 4$ (2 - 5 - 2 - 4 - 3)

"Bransle Gay" primary row $P_0 = 11\ 2\ 0\ 5\ 3\ 10$ (3 - 2 - 5 - 2 - 5)

subsidiary row[4] $S.P_0 = 1\ 9\ 8\ 7\ 4\ 6$ (4 - 1 - 1 - 3 - 2)

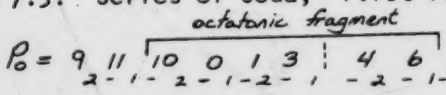
Fourth Section

"Pas-de-Deux" $P_0 = 11, 10\ 1, 2$ (3 - 1)

whole-tone variant $= 11, 9\ 1, 3$ (2 - 4 - 2) .

"Four Duos" and "Four Trios" $P_0 = 0\ 3\ 4\ 1\ 2\ 11, 10\ 7\ 8\ 9\ 6\ 5$ (3 - 1 - 3 - 1 - 3 - 1, 3 - 1 - 1 - 3 - 1)

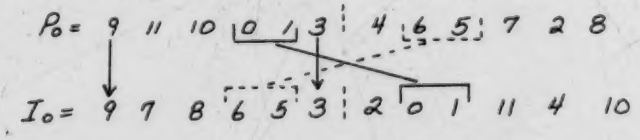
Figure 7.3. Series of Coda, "First Pas-de-Trois"



series is, for the most part, alternating ic 1s and ic 2s. The second hexachord is identical in pc content to the first under inversion at t=11. Also of importance is the inclusion of an octatonic scale fragment in order positions three through eight.

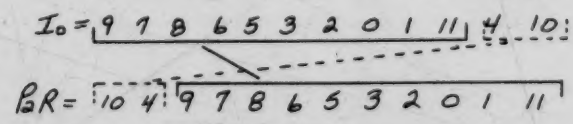
There are only five rows used, P_0, P_0R, I_0, I_0R and P_2R. All four row forms are present and there are two retrograde forms. There are some similarities between rows I_0 and P_0 which are diagrammed in Figure 7.4. The most obvious similarity is the retention of pcs 9 and

Figure 7.4. Similarities between P_0 and I_0



3 as the end elements of the first hexachord. Also retained are two dyads (pcs 6-5, 0-1) either in order positions four and five or eight and nine. Similar characteristics are found between P_0R and I_0R. The relationship between I_0 and P_2R, however, is quite different and is illustrated in Figure 7.5. Order positions one through ten of I_0 are

Figure 7.5. Similarities between I_0 and P_2R

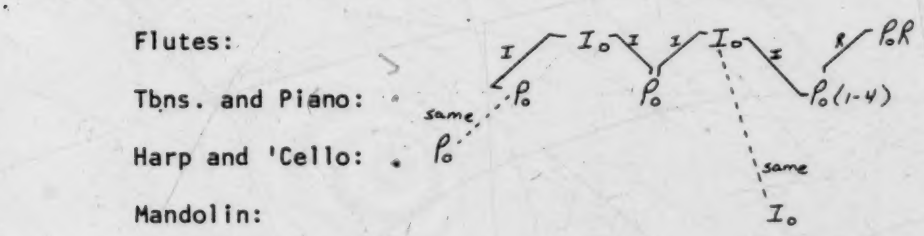


identical to order positions three through twelve of P_2R. This is a result of the exact symmetry of both ic and direction from order

positions one through ten of the prime. Also, the dyad pcs 4-10 from the end of I_0 becomes the initial dyad of P_2R. This relationship is similar to rotation, except for the reversal of pcs 4 and 10.

The coda is in bar form (AA'B). A schematization of the initial A section is given in Figure 7.6. The structure of the A' section is

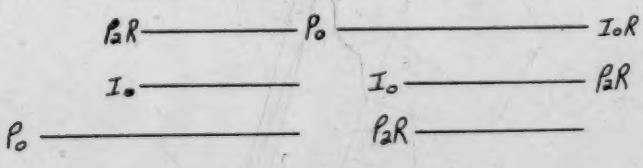
Figure 7.6. Coda of "First Pas-de-Trois" mm. 185-211



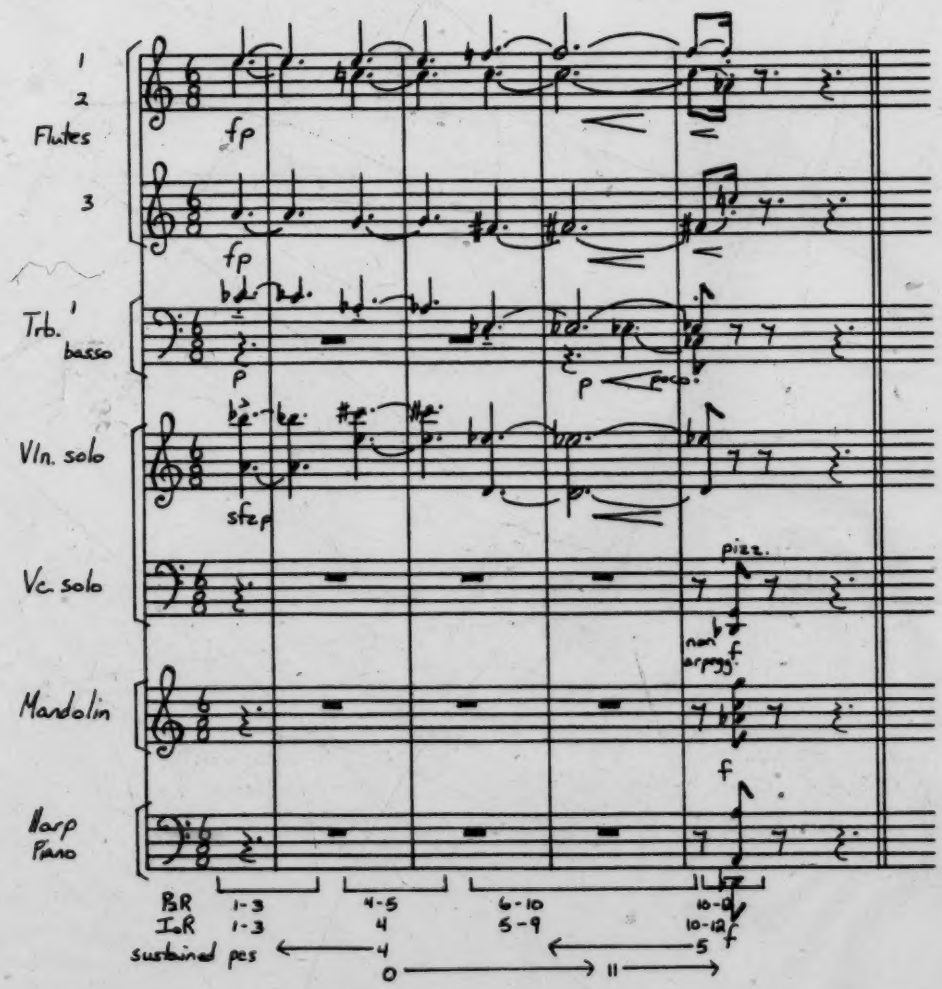
identical except for the absence of the initial P_0 row. Consistently the relationship between adjacent rows is inversional, alternating between P_0 and I_0. Only twice are adjacent rows the same and in one case the relationship is retrograde ($P_0(1-4)$-P_0R).

The serial structure of the B section (see Figure 7.7) concen-

Figure 7.7. B section of Coda mm. 234-253



trates on the similarities between I_0 and P_2R. Initially these two rows are combined with P_0, which results in the relation inversion (P_0-I_0) and retrogression (P_0-P_2R) between rows. Also retained in all three rows are the dyads 6-5 and 0-1. The last row pair (I_0R-P_2R, see Example XIII) are vertical and simultaneous. The rows are divided into three-, four- or five-note segments and placed in chords. Within

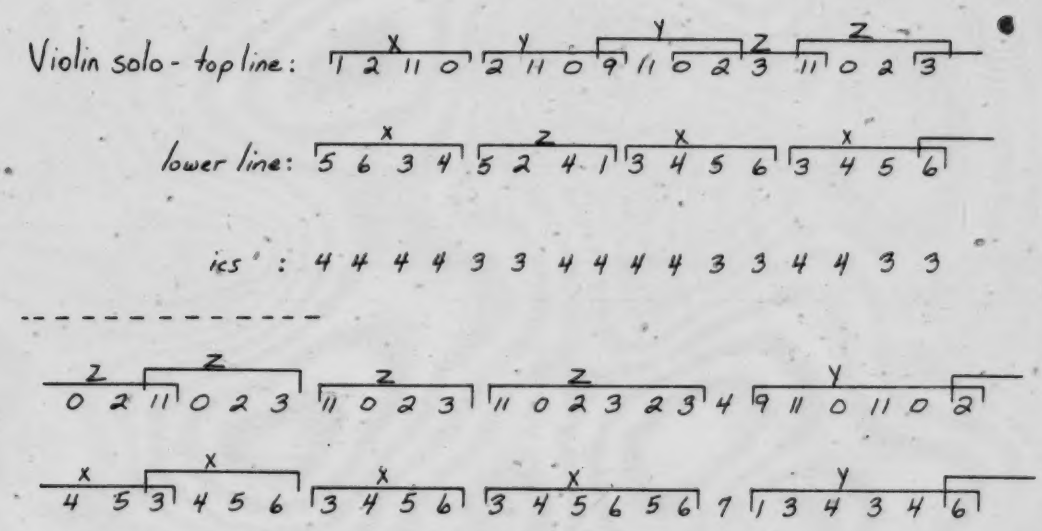
Example XIII. Agon, MM. 249-53 (P. 45, MM. 8-12).

measures 251 to 253, pcs 0, 2, 3, 5 and 6 are stated which are the common elements from both rows (order positions five to nine of I_0R and six to ten of P_2R).

Throughout this movement two types of nonserial material are used. The first type is sustained pcs, usually forming a 5 dyad. The first occurrence is pcs 0 and 7 in measures 185 to 191; the second is pcs 5 and 0 in measures 208 to 211 and the final occurrence is pcs 10 and 5 in measures 231 to 233. These sustained pcs set up tonal polarities, which are not necessarily supported by the accompanying serial statements. The polarities established by sustained pcs fall by perfect fifths from the initial C through F to $B^{\flat}$. Because of the lack of nonserial material, the concluding section of this movement does not establish a strong polarity.[5]

The second type of nonserial material occurs in the solo violin passage of measures 193 to 208 and 213 to 229. The solo consists of a sequence of two-part chords which produce only two vertical ics (3 and 4). The first of these passages is diagrammed in Figure 7.8. Horizontally each line can be seen to derive from four-note segments which are, in some cases, overlapping. It is significant that all four-note segments can be classified into three types. Each type is represented by only two collections. The first type consists of four chromatically contiguous pcs. The second type contains the ic structure of 2-1-2, while the third type contains the ic structure 1-2-1. Within each type permutation is frequent.

The A sections concentrate on adjacent rows related by inversion and include the violin passage formed from nonserial material. The B

Figure 7.8. Violin Solo mm. 193-208 of Coda



X = chromatic tetrachord 11 0 1 2 or 3 4 5 6

Y = $9_{2-1}\ 11\ 0_{1-2}\ 2$ or $1_{2-1}\ 3\ 4_{1-2}\ 6$

Z = $11\ \underset{1-2-1}{0\ 2\ 3}$ or $1\ \underset{1-2-1}{2\ 4\ 5}$

section concentrates on a pair of rows which are related by retrograde inversion but, more importantly, this pair of rows is rotationally related. The whole movement is connected by the sustained ic 5s, which outline tonal centres.

Third Section

The third section of this work, "Second Pas-de-Trois", consists of three movements; "Bransle Simple", "Bransle Gay" and "Bransle Double." The entire section is serially constructed. Although each movement is based on a different row, all rows share some similarity of construction. The rows utilized in this section are shown in Figure 7.9. The

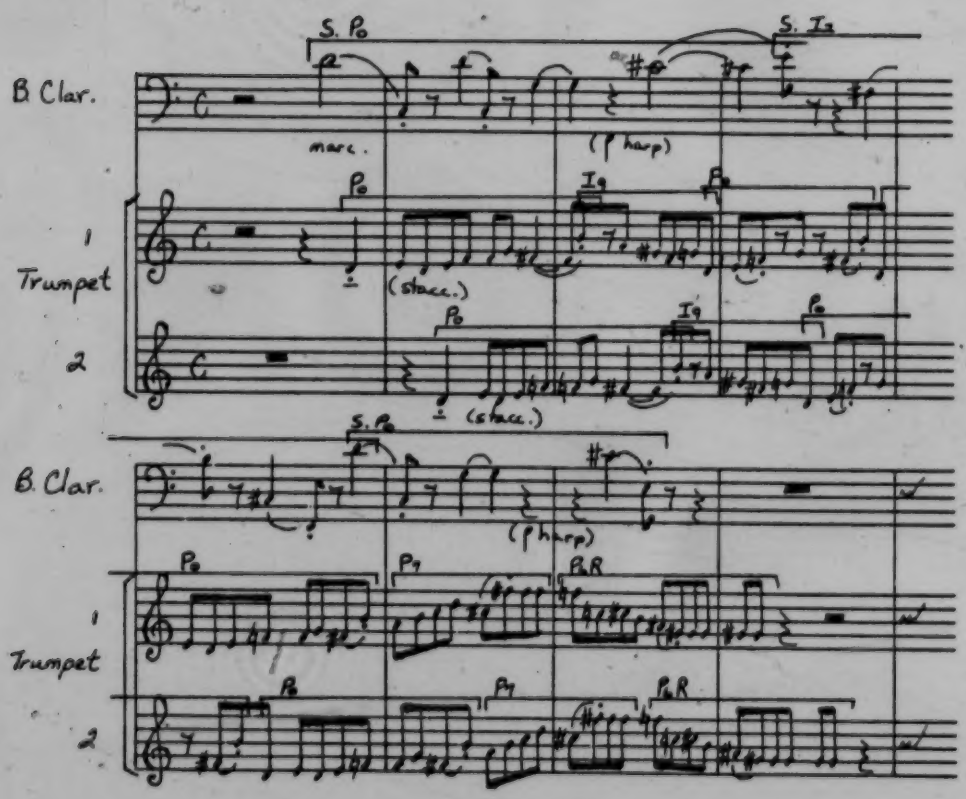
Figure 7.9. Series used in "Second Pas-de-Trois"

"Bransle Double" $P_0 = \overset{A}{0}\ 2\ 1\ 3\ 5\ 4\ 9\ \overset{B}{7}\ 8\ 2\ 10\ 11\ 1\ 6$

	subsidiary row	primary row
"Bransle Simple"	$S.P_0 = 2\ 0\ 5\ 7\ 3\ 5\ 1\ 4$	$P_0 = 2\ 4\ 1\ 5\ 2\ 7\ 6\ 11$
"Bransle Gay"	$S.P_0 = 1\ 9\ 8\ 7\ 4\ 2\ 6$	$P_0 = 11\ 2\ 0\ 5\ 3\ 10$

"Bransle Simple" and "Bransle Gay" each utilize two rows, the primary and the subsidiary. The subsidiary rows dictate only a small amount of material and thus, have a subsidiary role. Throughout the "Bransle Simple" the subsidiary row is used to accompany the primary, while in the "Bransle Gay" it provides all the material for a short passage (see Example XIV).

The relationship between rows becomes clear if we consider the hexachordal divisions of the "Bransle Double" row (Figure 7.10). Certain similarities are readily apparent: identical ic content and

Example XIVa. Agon, MM. 298-305 (P. 52, MM. 1-8).

Example XIVb. Agon, MM. 330-335 (P. 55, MM. 8-13).

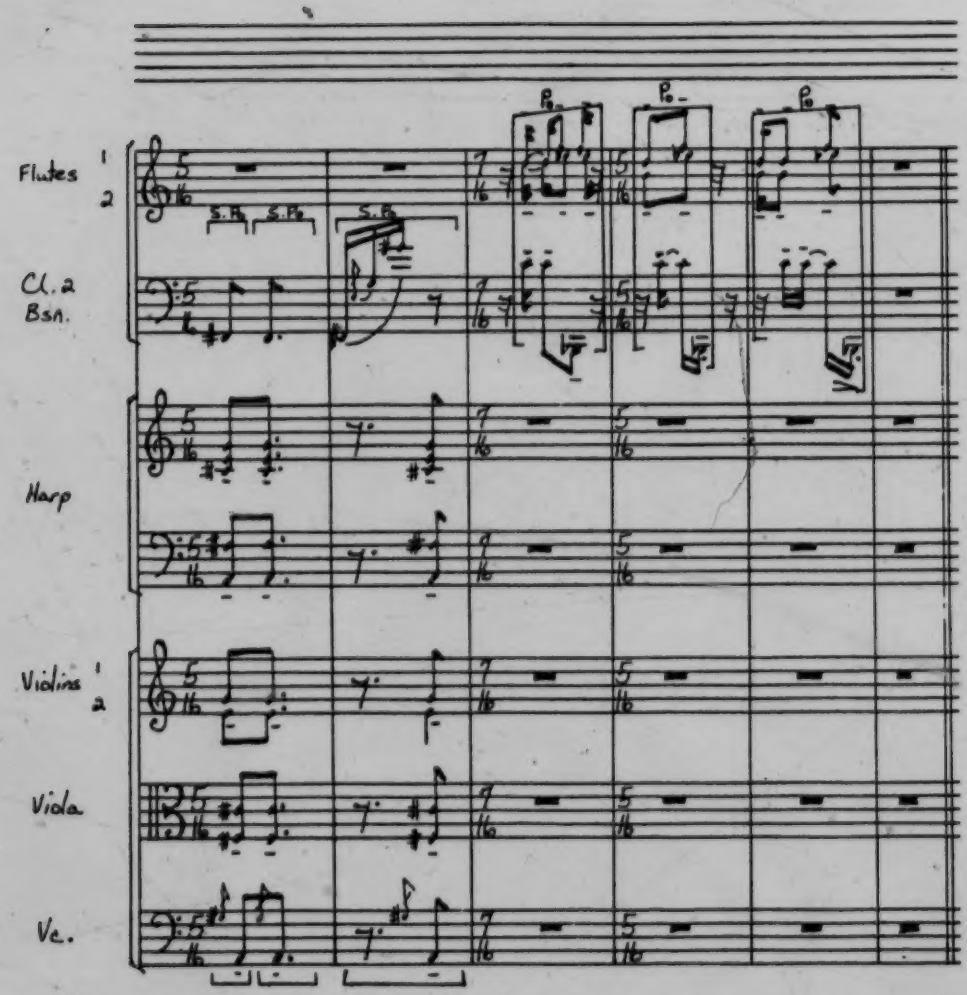



Figure 7.10. Hexachord Division of "Bransle Double" Series

$P_oA = 0\ 2\ 3\ 5\ 4\ 9$ $\langle 3,3,3,2,3,1\rangle$

$P_oB = 7\ 8\ 10\ 11\ 1\ 6$ $\langle 3,3,3,2,3,1\rangle$

identical vectors. These two hexachords contain mutually exclusive pc collections and are not similar under the operations inversion or transposition. We have, then, two different pc sets with identical possibilities for ic content.

All other rows are related to one of these hexachords. The rows related to P_oA hexachord are shown in Figure 7.11. From this

Figure 7.11. Rows related to P_oA Hexachord

P_oA	$= 0_1, 2_2, 3_3, 5_4, 4_5, 9_6$	{0,2,3,4,5,9}
"Bransle Simple"	$P_o = 2_1, 4_2, 5_3, 7_4, 6_5, 11_6$	{2,4,5,6,7,11} = P_oA t=2
"Bransle Gay"	$S.P_o = 1_4, 9_1, 8_2, 7_{3-3}, 4_5, 6_6$	{4,6,7,8,9,1} = P_oA t=4

example, it is clear that P_oA and P_o from "Bransle Simple" are identical under the operation transposition (t=2). With regard to the $S.P_o$ from "Bransle Gay", an examination of the row doesnot indicate any similarity with P_oA. If considered as unordered pc sets, however, we find that $S.P_o$ is equivalent to P_oA at t=4. Although these are the same pc set, the ordering of each row is different. The order positions of $S.P_o$ are 6, 4, 5, 3, 1, 2 of P_oA. Only two dyads (order positions 4-5 and 1-2) are reversed from what would be a transposed retrograde of P_oA. This permutation brings about the inclusion of additional ics.

A similar examination of rows related to P_oB is shown in Figure 7.12. For both rows, unordered pc sets must be considered to reveal similarities and the levels of transposition. Permutation is evident

Figure 7.12. Rows related to P_0B Hexachord

P_0B	$= 7, 8, 10, 11, 1, 6$	{4,7,8,10,11,1}
"Bransle Simple"	$S.P_0 = 2, 0, 7, 5, 1, 4$	{0,1,2,4,5,7} = P_0B at t=6
"Bransle Gay"	$P_0 = 11, 2, 0, 5, 3, 10$	{10,11,0,2,3,5} = P_0B at t=4

in the ordering of both rows, with the $S.P_0$ of "Bransle Simple" occurring as 2, 6, 5, 4, 1, 3 of P_0B and P_0 of "Bransle Gay" occurring as 1, 3, 2, 5, 4, 6 of P_0B.

Of particular intersst is the lack of the total chromatic between P_0 and $S.P_0$ of the "Bransle Simple." This is due to the difference in transposition levels. This difference results in maximum pc intersection between the two rows (four pcs in common). Due to the same transposition level, the two rows of the "Bransle Gay" produce the total chromatic.

"Bransle Simple"

The "Bransle Simple", for two male dancers, is a ternary structure (A mm. 278-287; B mm. 288-297; A' mm. 298-309). The A section is a canon utilizing only the primary row while the A' section is identical but adds an accompaniment in the bass clarinet and harp, which utilizes the subsidiary row. Characteristic of the B section is the serial statements moving freely from one line to another.

Each section has the same cadence structure, involving four rows, as shown in Figure 7.13. At the end of each section, the last pcs of three lines are sustained forming a D major triad (pcs 2, 6 and 9) with an added sixth (pc 10). The added sixth from the first section

Figure 7.13. Sectional Cadences in "Bransle Simple"

Clar. 1 P_7 - 9 11 0 2 1 [6]

Clar. 2 P_3 - 5 7 8 10 [9 2]

Tbns. I_0 - 2 0 11 9 10 5

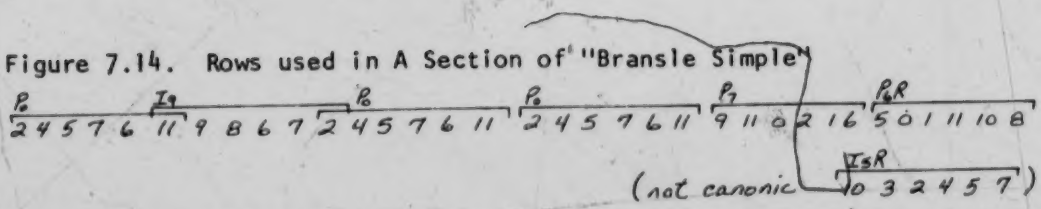
Harp I_5 - 7 5 4 2 3 [10]

Pcs which are boxed are sustained.

continues to become the first element of a new row in the second section (P_8) and links the second and third sections by combining with the initial pcs of two new rows to form a B♭ major triad. Also of interest in this cadence structure is the invariant pcs between pairs of rows. Between I_0 and P_7 four pcs remain invariant (pcs 9, 11, 0, 2), all of which are diatonic in A minor, the initial tetrachord of this key. The other pair of rows (P_3 and I_5) also holds four pcs invariant (pcs 5, 7, 10, 2). This invariant collection is diatonic within B♭ major or F major. Throughout this section, then, we have a bitonal effect between A minor and B♭/F major. This conflict continues through the final sustained chord if it is considered as two simultaneous chords--D major (pcs 2, 6 and 9) and B♭ major (pcs 10 and 2)-- instead of a chord with an added sixth. The relationship of the two tonal centres a third apart is inherent in the row itself, beginning with a D minor tetrachord (pcs 2, 4, 5 and 7) and then abruptly shifting to a B tonal area (pcs 11 and 6).

The body of the A section is a unison canon for two trumpets. The rows used in this canon are shown in Figure 7.14. Initially the row pair P_0-I_9 is used, which shows maximum invariance under inversion (four invariant pcs). The invariant collection consists of pcs 2, 6, 7

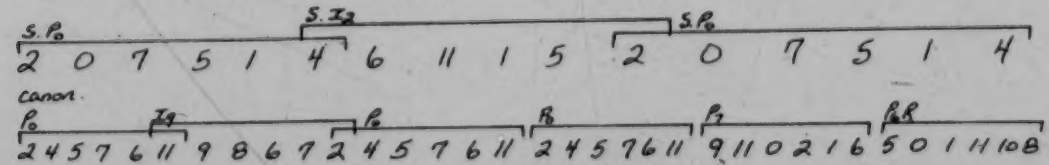
Figure 7.14. Rows used in A Section of "Bransle Simple"



and 11 and produces a biharmonic effect with the occurrence of both a G major and B minor chords, again emphasizing centres a third apart. Also of importance is the retention of the rows' outer elements (pcs 11 and 2). The canon continues with rows showing maximal pc invariance under transposition (three pcs being retained). The rows involved are P_0-P_7 and P_7-P_6R and the invariant segments are pcs 11, 2, 6 and 11, 0, 1 respectively. Both of the invariant segments indicate a B centre with the first segment being a B minor triad and the second a chromatic collection with B as its lowest note. The final row, I_5R, holds two pcs invariant with the preceding row, P_6R. The invariant pcs, 10 and 5, suggest a B♭ centre. Throughout this section we find the initial concentration on the centres of B and G, moving to a B centre, continuing to a B♭ and concluding with a biharmonic effect centring on B♭ and D. The temporary centres are all indicated by invariant segments.

The A' section has the same serial canonic structure as the A section, but now an independent contrapuntal strand is added in the harp and bass clarinet utilizing the subsidiary row. The total structure of this section is illustrated in Figure 7.15. The subsidiary

Figure 7.15. Serial Structure of A' Section of "Bransle Simple"



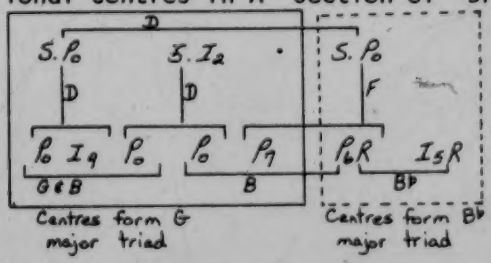
line is constructed with similar principles as the canonic line, i.e. utilizing maximal invariance under inversion and retention of the outer elements of each row. The invariant collection between $S.P_0$ and $S.I_2$ is pcs 1, 2, 4 and 5, which suggests a D centre. Invariance is also represented between simultaneous row statements and these are summarized in Figure 7.16. All examples represent maximal invariance

Figure 7.16. Simultaneous Invariance in A' Section

$S.P_0$ and P_0 -4	invariant elements-2, 4, 5, 7	D minor
$S.I_2$ and P_0	invariant elements-2, 4, 5, 6, 11	D
$S.P_0$ and P_7 -P_6R	invariant elements-0, 1, 2, 5	F

between the prime and subsidiary rows (four pcs) or the prime and the inversion of the subsidiary (five pcs). Again, the temporary centres are a third apart. It is significant that all temporary centres form either a G major or a B♭ major triad (see Figure 7.17). The centres

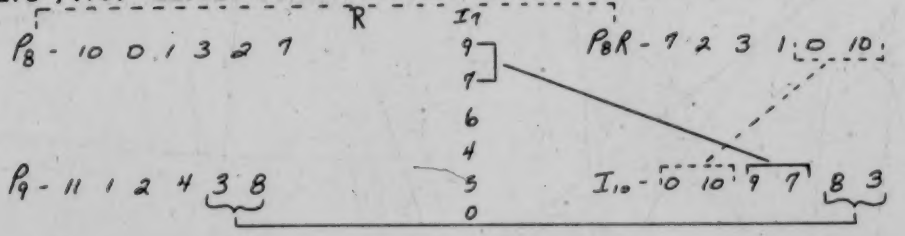
Figure 7.17. Tonal Centres in A' Section of "Bransle Simple"



at the beginning of this section form a G major triad, while those at the end form a B♭ major triad. These longer tonal relationships are again a third apart and reflect on a larger scale the tonal relationship found in the basic material.

The B section uses the series vertically and horizontally and is characterized by statements split between two or more instrumental lines. The serial structure of this is shown in Figure 7.18. There

Figure 7.18. Serial Structure of B Section of "Bransle Simple"



appears to be a quasi-symmetrical structure here, with I_7 as the focal point in its chordal texture and the other rows placed linearly around it. P_8 and P_8R provide a retrograde relationship which is not supported by the other linear row pair. P_9 and I_{10} do, however, contain the same 5 dyad, 3-8, although it occurs at the end of each series and not in a retrograde placement. I_{10} also shares a dyad with all other rows; pcs 9-7 with I_7 and pcs 0-10 with P_8 and P_8R.

The A sections of "Bransle Simple" concentrate on maximal invariance between various rows. As a result of the invariance, short term and longer term tonal centres are produced, always in pairs separated by a third. This relationship reflects the dual pc centres within the row itself. The central section is symmetrical and is chiefly concerned with the preservation of pc segments, involving only two elements. With the inclusion of the total chromatic in this section, short term centres are avoided. Continuity is achieved throughout this movement by the same cadence structure occurring at the end of each section.

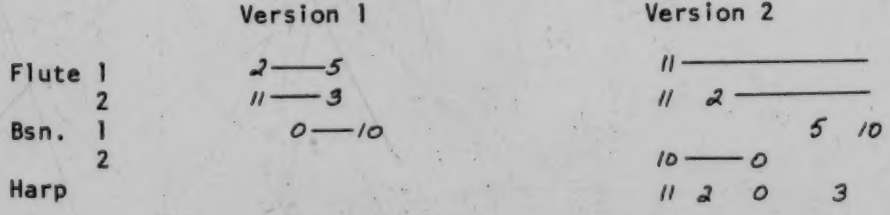
"Bransle Gay"

The "Bransle Gay" is a ternary structure (ABA'). The A section (mm. 310-320) states the primary row in a chordal texture, while in its

return (A', mm. 330-335) the subsidiary row is utilized as well. The B section (mm. 321-329) utilizes both the primary and subsidiary rows in a contrapuntal texture. Throughout this movement the castanets maintain a 3/16 meter while all other parts alternate between 3/16, 7/16 and 5/16.

The chordal texture throughout the A section uses only P_0. Figure 7.19 shows the only two dispositions of the series. There

Figure 7.19. Structure of P_0 chord in A Section of "Bransle Gay"



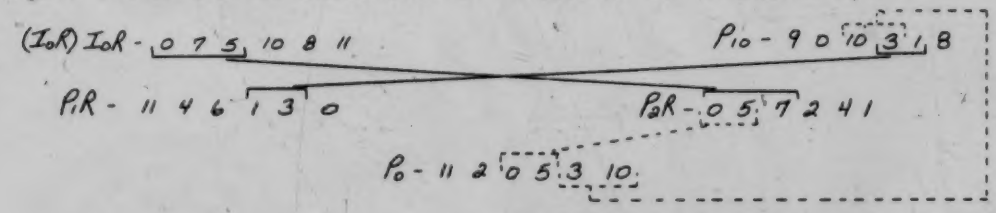
are eight statements altogether and version 2 occurs only as the fourth and sixth chords. Version 2 indicates an $E^{\flat}$ centre with the 5 dyad (pcs 3-10). Version 1, however, seems to indicate $B^{\flat}$ as the centre with the 5 dyad (pcs 10-5) and an added fourth (pc 3). Throughout this brief section, there seems to be an alternation of $B^{\flat}$ and $E^{\flat}$ as centres but it clearly ends on $B^{\flat}$.

The A' section is also in a chordal texture. There are six serial statements, the first three being the subsidiary row and the last three are version 1 of the primary row. There are instrumentation differences, with the subsidiary rows in strings, harp and clarinet while the primary statements are sounded in the flutes and bassoon. The subsidiary chords are all five-note chords with pc 8 as a grace note. Each chord has two centres, A as the root of a dominant seventh

(pcs 9, 1, 4 and 7) and F# as the root of a triad (pcs 6, 9 and 1). These proceed to the B♭ rooted P_0 chords which end the movement.

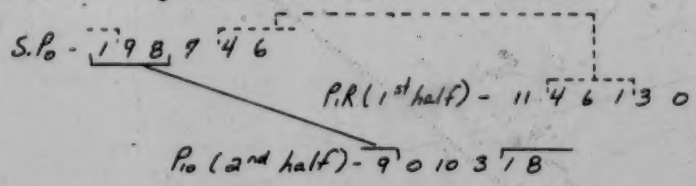
The B section presents eight serial statements in a linear format. Two series (I_0R and $S.P_0$) are each stated twice in succession. The majority of statements form a symmetrical structure around P_0 as illustrated in Figure 7.20. Both of the initial two rows share a

Figure 7.20. Serial Statements of B section of "Bransle Gay"



two- or three-note segment with rows from the second half. In addition, each of the rows from the second half (P_{10} and P_2R) share a two-note segment with the central row, P_0. Following this structure are two statements of $S.P_0$ which share a three-note segment with a row in each half of the preceding structure (see Figure 7.21).

Figure 7.21. Segmental Invariance in B section



The A sections of this movement utilize the series vertically and produce tonal centres while the B section is symmetrically structured and involves the retention of two- or three-note segments. Similarities exist between this movement and the preceding one, particularly that the outer sections are in a much simpler format and

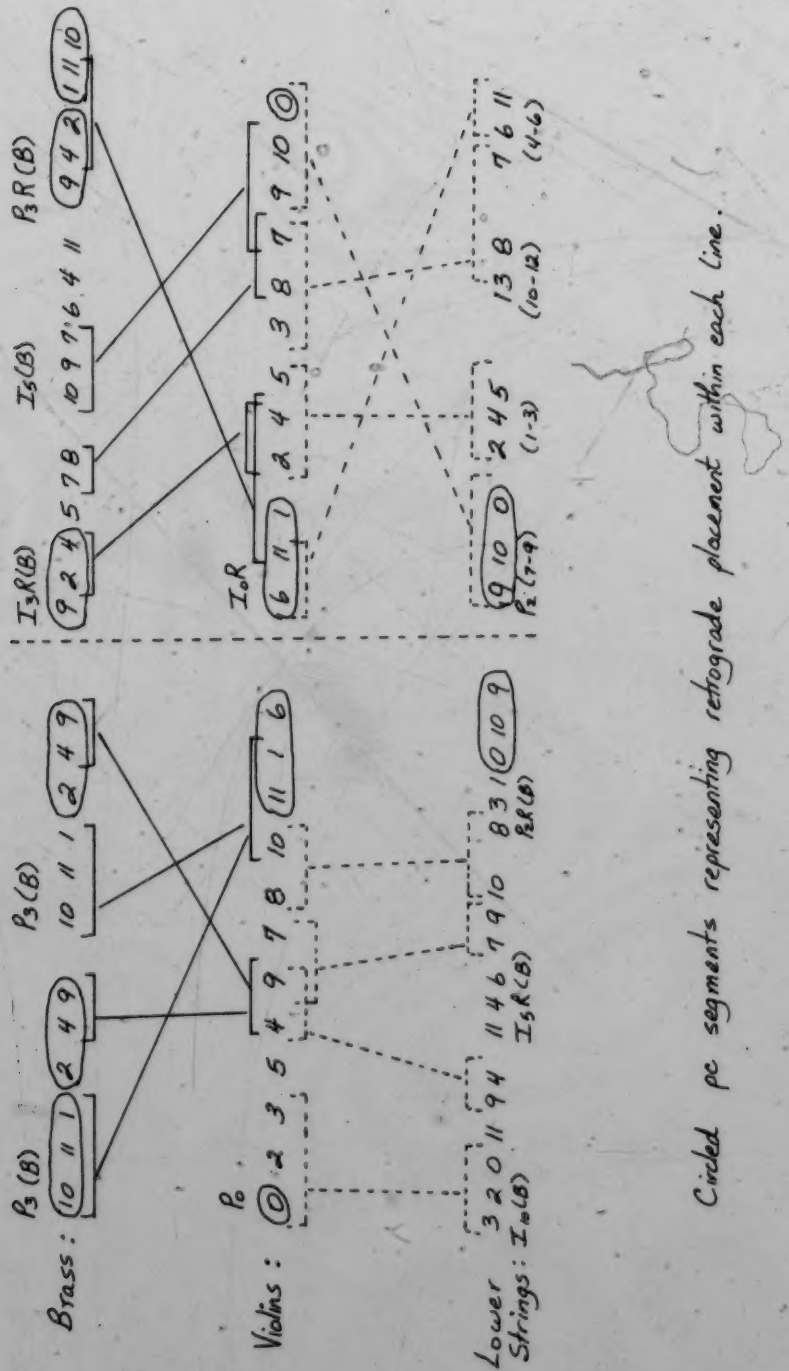
indicate tonal centres, while the central sections are both symmetrical and concentrate on invariant segments.

"Bransle Double"

The "Bransle Double" is a three-part structure plus coda, AA' BA Coda. The A sections utilize the twelve-note row, its hexachord subdivisions and its trichord divisions all in linear fashion. Vertical serial usage characterizes the B section and coda and in both sections the rows are restricted to the transposition level of t=2.

The serial structure of the A' section (mm. 344-351) is shown in Figure 7.22. The A sections (mm. 336-344 and 364-372) are the same as the brass and violin lines of Figure 7.22. The violin line consists of two twelve-note rows (P_o and I_oR), which are in a retrograde inversional relationship. With regard to unordered pc segments, a retrograde structure is found in this line between initial and final elements (pcs 0-6 and 6-0) and the retention of one three-note segment (pcs 11, 1, 6). Also preserved are two unordered four-note segments (pcs 2, 3, 4, 5 and 7, 8, 9, 10) which do not receive retrograde placement. The brass line consists of five hexachordal statements and is also arranged in a retrograde structure (pcs 10, 11 1; 2, 4, 9 and 2, 4, 9). The first half of the retrograde structure contains two hexachords while the second half contains three. The lower string line consists of three hexachord statements followed by one complete series divided into trichords. The retrograde structure is minimally represented with only one three-element segment being retained across the midpoint (pcs 9, 10, 0).

Figure 7.22. Serial Structure of A' Section , "Bransle Double"



It is also significant that a retrograde relationship is produced between the brass and lower strings. The second half of the brass line and the first half of the lower string line each state three hexachords, while the alternate half of the lines contain only two hexachords (or the equivalent). Further, the central hexachords of the three hexachord halves are related by retrograde ($I_5(B)$ and $I_5R(B)$), and neither of these hexachords are involved in the linear retrograde structures.

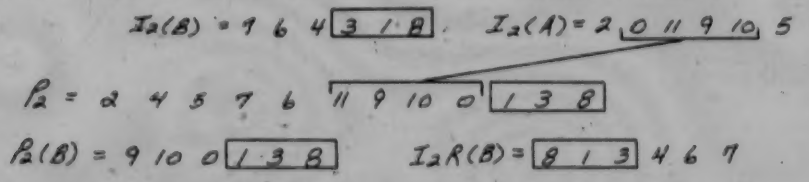
Between any two simultaneous lines, there are four invariant unordered pc segments in each half of the retrograde structure. Of particular interest is the relationship between I_0R and the trichords of P_2. There are four ordered pc segments retained, three of which contain three notes and one which contains two. The outer segments exchange position (i.e. retrograde placement) while the inner segments maintain the same positions. There is one pc from each row which is not held invariant in these segments (pc 1). This is an interesting relationship with segments remaining ordered but the segments themselves being permutated.

The B section (mm. 352-364) uses the material vertically and is restricted to the transposition level t=2. This is the same transposition level used in the primary row of "Bransle Simple." The materials used in this section are the row P_2, its hexachord ($P_2(A)$) and several segments of P_2 involving two, three or four notes. Particularly significant are four occurrences of the segment order positions one through four of P_2 (pcs 2, 4, 5 and 7). This segment was held invariant in the A' section of "Bransle Simple" and the pcs of

this segment were prominently articulated throughout the movement. It appears in this section that three-note segments have become less important than the division into four-note segments. Three-note segments (order positions 1-3, 4-6, 7-9, 10-12) each occur only once, except order positions seven through nine which occurs twice. Four-note segments, however, account for seven of the thirteen segments stated.

The coda (mm. 373-386) utilizes only hexachords and complete rows at the transposition level of t=2. This section states the material linearly but often pcs are sustained to form vertical structures. The serial structure of this section is shown in Figure 7.23. One three-note segment becomes structurally important (pcs 1, 3

Figure 7.23. Serial Structure of Coda of "Bransle Double"



and 8), which occurs four times and three of these are at the end of serial statements resulting in a cadential feeling. Only one four-note segment remains invariant in this section (pcs 9, 10, 11 and 0), a chromatic collection.

Throughout this section we find material of three-, four-, six- and twelve-note units utilized. The "Bransle Double" is the only movement to utilize a twelve-note row and it is the only movement in which shorter segments of the row are used independently. Within the A sections hexachordal and trichordal divisions predominate,

while in the B section four-note units are more common. All three movements have a tripartite structure, ABA. with the addition of a coda to the "Bransle Double." The A sections of each movement are structured quite traditionally (canon, chordal repetition and retrograde symmetry), while the B sections are less-traditionally structured. With the exception of the coda, the serial usage throughout the "Second Pas-de-Trois" alternates between sections of vertical and horizontal distribution (see Figure 7.24). Throughout this section, invariance

Figure 7.24. Serial Usage Throughout the "Second Pas-de-Trois"

"Bransle Simple"			"Bransle Gay"			"Bransle Double"			
A	B	A'	A	B	A'.	AA'	B	A	Coda
H	V	H	V	H	V	H	V	H	H

H= horizontal use of material
V= vertical use of material

consistently involves two- and three-note segments, until the B section of the "Bransle Double" where four-note segments become more prominent. This is significant because all four-note segments in this section are related to the four-note row which structures the fourth section of this work.

Fourth Section

The fourth section of this work is the longest and consists of three movements; "Pas-de-Deux", "Four Duos" and "Four Trios." Essentially the whole fourth section (with the exception of the coda to the "Four Trios") is based on a four-note row (see Figure 7.25),

Figure 7.25. Four-note Row of Fourth Section

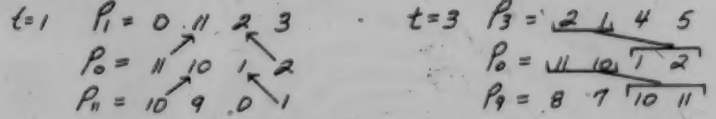
$P_0 = 11\ \underset{1}{10}\ \underset{-3}{1}\ \underset{-1}{2}$

or certain variants of it. This is the only example of a symmetrically arranged row, in regard to ic content, found in Agon.

The row consists of four elements within the span of ic 4. The construction of the row may be thought of in two ways: firstly, as a pair of linear dyads both encompassing a semitone, although the direction is different, at a distance of a minor third ($\overset{s}{11}\ \overset{s}{10}\ \underset{-3}{1}\ 2$) and secondly, as a juxtaposition of two minor thirds, formed by either the inner or outer elements, with direction preserved and at a distance of a semitone ($11\ \underset{s}{10}\ 1\ 2$).

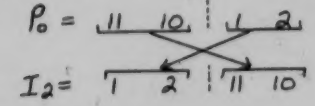
The vector for this set is <2,1,2,1,0,0> which indicates that at t=1 or t=3 two pcs remain invariant, while at t=2 or t=4 only one pc is preserved. Furthermore, at t=1 one of the original minor thirds remains intact, although it changes position from outer to inner elements or viceversa. At t=3 one of the semitones remains but it is also repositioned (see Figure 7.26).

Figure 7.26. Invariance of Pc Pairs



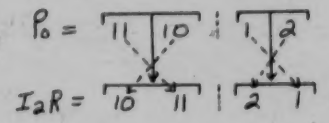
For this set, each serial transformation yields one set which retains the same pc content as the original. Under inversion this set is I_2. It is important that not only pc content remains intact but also the dyadic partitioning of the set, although the dyads themselves are reversed (see Figure 7.27). An equally significant

Figure 7.27. Dyadic Partitioning Between P_0 and I_2



relationship exists between the prime and the retrograde inversion form which retains pc content (I_2R). In this case, however, the dyads retain their order positions but the internal ordering of each is reversed, as shown in Figure 7.28. Most obviously, the retrograde

Figure 7.28. Internal Reordering Between P_0 and I_2R

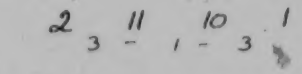


row which retains pc content includes reversal of both dyads and their internal order.

These features of the original row provide compositional possibilities for the recurrence, at close proximity, of single pcs and of two- and four-note collections, with internal permutations. The idea of repeating pcs or small groups of pcs was fundamental to Stravinsky's early serial technique, as evidenced by his inclusion of such repetitions within some of his longer rows (Cantata and Septet) and invariance of short segments in Canticum Sacrum.

In addition to the prime series and its various serial transformations, Stravinsky also makes use of other variants. The most basic variant involves rotation techniques and produces the maximum number of ic 3s (2). The minor third, here, becomes a more prominent linear interval (see Figure 7.29). This variant retains a symmetrical structure and, in fact, is identical to P_0 rotated to begin on the

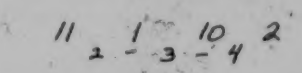
Figure 7.29. Variant 1 of Fourth Section



fourth element. Variant 1 is present in the solo violin at measures 412-13 of the "Pas-de-Deux." Both variant 1 and the prime contain only the ics represented by maximum entries in the vector (ics 1 and 3) and each contains the maximum number of one ic.

There remain several permutations of this four-note set, but one is of importance to us here. This variant introduces linear intervals which have not been utilized (ics 2 and 4), both of which are represented singly in the vector (see Figure 7.30). The only differ-

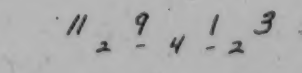
Figure 7.30. Variant 2 of Fourth Section



ence between variant 2 and the prime is the reversal of order positions two and three. This variant occurs in the solo violin in measure 413 of the "Pas-de-Deux."

Stravinsky also uses variants which are not as closely related to the prime as those already mentioned. For example, in the male dancer's variation of the "Pas-de-Deux", a variant is used which retains the same basic relationships as the original, although at first the intervals appear to be quite different (see Figure 7.31). Each interval

Figure 7.31. Whole-tone Variant of Fourth Section



of the prime row has been augmented by ic 1 to arrive at this variant,

which forms a whole-tone scale fragment. This variant has the same invariant properties (P_0, I_2, I_2R and P_0R) and possibilities for permutation as the prime. The vector for this variant-⟨0,3,0,2,0,1⟩-introduces a new feature, only even-numbered intervals are possible. With this variant, maximal invariance is extended to three pcs at t=2.

The final type of variant maintains the same linear ics as the prime but with directional alterations. The pc content of the original is not retained and, therefore, neither are the internal relationships inherent in the prime. Both of these variants in Figure 7.32 preserve

Figure 7.32. Variants 3 and 4 of Fourth Section

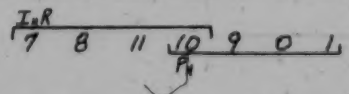
Variant 3 $\overset{}{\underset{3}{//}}\ \overset{2}{\underset{-}{}}\ ,\ \overset{1}{\underset{-3}{}}\ 4$

Variant 4 $\overset{}{\underset{3}{//}}\ \overset{2}{\underset{-}{}}\ ,\ \overset{3}{\underset{-3}{}}\ 6$

the linear intervals of two ic 3s and one ic 1. Each of these variants extends the range of the four-note collection from ic 4 in the original, to ic 5 in variant 3 and finally to ic 7 in variant 4. The first of these variants, although derived from the prime, is a diatonic tetrad (B minor), while the second forms a major/minor triad.

In the coda of the "Pas-de-Deux", Stravinsky consistently uses two rows with a common element, producing a seven-note set which is shown in Figure 7.33. This set contains all the chromatic pcs within

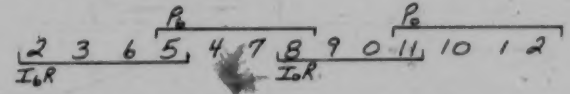
Figure 7.33. Seven-note Set of Fourth Section



ic 6. The relationship between four-note rows is an untransposed inversion.

Another extension of the four-note row is constructed from a pair of overlapping (one common note) seven-note rows, as shown in Figure 7.34. This row, containing the total chromatic, is interesting

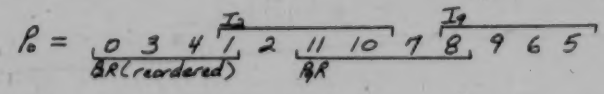
Figure 7.34. Thirteen-note Row of Fourth Section



in that the first and last pcs are the same. The second seven-note row is identical to the first at t=6. Also of note is the fact that the untransposed retrograde inversion of the thirteen-note row is identical to the prime.

A twelve-note row can easily be made by joining two seven-note rows with two common pcs, as illustrated in Figure 7.35. The initial

Figure 7.35. Twelve-note Row from the Fourth Section



four-note row is not one of the serial transformations of the prime, but rather, the inverted form of variant 1. The second seven-note set is a transposition of the initial set at t=7, and, therefore, could function as the initial set for another twelve-note row (cyclic generation). This series is very similar to that used by Webern in his orchestral Variations Op. 30, the only difference being the reversal of the three initial elements.[6] One significant feature of the reordering of the initial tetrachord is that, the beginning and ending elements of Stravinsky's row form ic 5 (as opposed to ic 1 in Webern's row), which facilitates his use of these outer elements as centres of

polarity in a "quasi-tonal" fashion.[7]

Incorporated as the central tetrad of this series (order positions five through eight) is the major/minor triad, isolated previously as variant 4 of the four-note rows. This twelve-note series derives quite logically from the four-note row and certain variants of it which are used throughout the movement. The series itself is found within the "Four Duos" and the first section of the "Four Trios."

It should be noted that the nonserial material found in the violin passage in the coda of the "First Pas-de-Trois" consisted of four-note units. Of the three types of units, two are equivalent to material in the fourth section. Both the prime row and its variant 3 are utilized.

"Pas-de-Deux"

The "Pas-de-Deux", the longest movement in Agon, is divided into three sections, Adagio, Piu mosso and Coda. The Adagio utilizes the prime row, its thirteen-note extension and variants 1 and 2 of the prime, while the Piu mosso uses the prime, variant 3 and the whole-tone variant. The coda employs both the prime and the seven-note row.

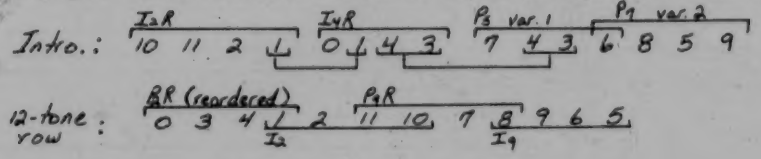
The Adagio, mm. 411-462, consists of an introduction (3 bars), section A (23 bars), section B (26 bars) and coda (11 bars). Wolternik states:

> The "Adagio" section of the "Pas-de-Deux" begins with a partially nonserial introduction [only I_2R is noted]. Although the total chromatic is present in a manner which suggests the exposition of a twelve-note row, the "row" which seems to be stated in this

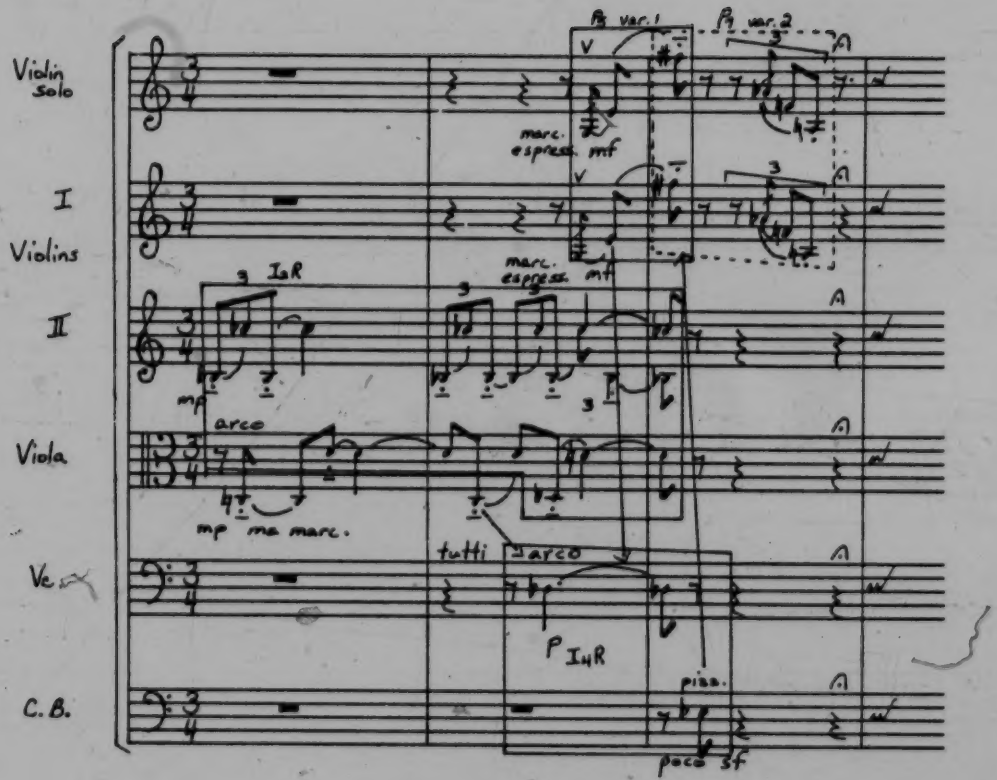
passage is not used again.[8]

The measures under examination are shown in Example XV. Wolternik's assessment of the introduction as 'partially nonserial' is accurate if one is only concerned with the prime form of the series. If, however, one considers the variants of the prime, the entire introduction is found to be serially derived. Figure 7.36 shows both

Figure 7.36. Similarities between the Introduction and Twelve-note Row



the series used in the introduction and the twelve-note row described in the introductory material. Certain similarities between this pair of rows become evident. Particularly, the presence of four four-note units are evident in each case. Further, the pc content of three of these units are the same, $I_2R\text{-}I_2$, $I_4R\text{-}P_2$ and $P_7\text{-}I_9$. An obvious difference between these structures is that two four-note units from the introduction are not in a serial transformation of the prime, while in the twelve-note row only one four-note unit is permutated. Because of the linear arrangement of four-note units in the twelve-note row, pc invariance between units results in the linking of adjacent units. The pattern of pc invariance between rows is 1-2-1. The pc invariance between adjacent units in the introduction form the same pattern (1-2-1). Because of the linear arrangement within these units, the invariance does not result in a link. The retained pcs, however, are all highlighted in some way. The first common pc (1) occurs simultaneously in the violas and 'celli, although the latter

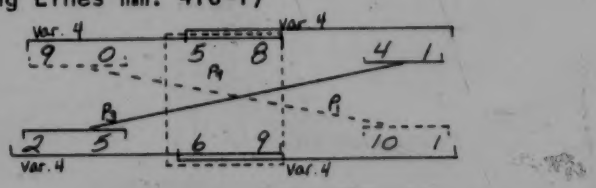
Example XV. Agon, MM. 411-413 (P. 65, MM. 1-3).

sustains it. The common dyad (pcs 4-3) is sounded only once, with pc 4 in the violins and pc 3 in the basses. The last invariant pc (6) occurs only once and acts as a common pivot-note between P_5 and P_7. It is significant that the invariant pcs in the introduction (pcs 1, 3-4, 6) are the complement of those found in the twelve-note row (pcs 1, 11-10, 8). The twelve-note row can be divided into two overlapping seven-note rows. Characteristics of the seven-note row are that it is constructed from two four-note units which overlap with one common note and the pc content chromatically fills an ic 6. The material from the introduction can also be divided into two halves, each of which includes characteristics of the seven-note row.

Are these mere coincidences in what Wolternik calls a 'partially nonserial' passage? The exposition of the prime row, variants of it and certain characteristics of the seven- and twelve-note rows are more than coincidence. Is Stravinsky not at least hinting at the rich potential of his short set and some of the many possibilities for its expansion, many of which are realized throughout the entire section? As Pousseur states; "everything still seems to be in the embryonic stage."[9] If this was Stravinsky's objective, one question remains to be answered--Why has he used variants instead of simply stating the twelve-tone row? This has to do with ic availability as indicated by the vector ⟨2,1,2,1,0,0⟩. If Stravinsky had restricted himself to the prime form of the row, only ics 1 and 3 would be present, with ic 1 in greater frequency. Through the use of variants 1 and 2, ics 2 and 4 have been included and the frequency of occurrence between ics 1 and 3 have been evened out. Throughout the introduction

Stravinsky has included all possible ics and the relative frequency of each is consistent with the possibilities shown in the vector.

Following the introduction, the prime form of the row predominates throughout the remainder of the Adagio. Only one short passage, measures 416-417, utilizes variants of the prime. This passage occurs in the solo violin and viola and is shown in Figure 7.37. Each line

Figure 7.37. Solo String Lines mm. 416-17



consists of three 3 dyads producing two overlapping major/minor chords (variant 4). The dyads of the violin line descend while those of the viola line ascend. An interesting relationship is formed because variant 4 is produced as the central tetrad of the twelve-note row and this sequence of variant 4 tetrads produce the prime tetrad. The most obvious statement of the prime is the second dyad of each line, which produces the original set at t=7. This passage contains two more statements of the prime which are more obscure. These are formed by the first dyad of the violin combined with the third dyad of the viola (P_1) and viceversa (P_3).

The body of the Adagio, sections A and B (mm. 414-450), utilize only the four-note row and its serial transformations. Patterns of pc retention between adjacent rows both highlight and outline the formal structure. A detailed examination of the rows used, the pc retention and the ics retained is presented in Figure 7.38. The norm

Figure 7.38. Adagio of "Pas-de-Deux"

Measure	Rows used	Pc Retention	Type of ic
A 414	I_9R		
	P_1	0	(octatonic scale 1)
	variant #		
	P_0		
	I_2	4	
	P_0	4	
	I_2	4	
	P_1	2	3
421	I_2	2	3
	I_4R	1	
	I_3	2	* 3
	P_0	2	3
	P_6	0	(octatonic scale 3)
	I_9R	1	
	P_9	2	3
	I_2R	2	* 1
429 1st ending	I_3R	2	* 3
	P_2	2	3
	I_3	2	3
	I_6R	1	
	I_9R	1	
	P_1	0	(octatonic scale 1)
B 437 2nd ending			
	P_0R	4	
	I_2	4	
	I_2R	4	
	P_1	2	3
	I_2	2	3

Figure 7.38 (continued).

Measure	Rows used	Pc Retention	Type of ic
		1	
	I_4R	2	1
	P_5R	2	3
	I_6R	2	3
	P_3	0	(octatonic scale 3)
	P_9	1	
	P_5	2	3
	I_6	2	1
	I_9R	2	1
450	P_7R		

SUMMARY

Total number of times pcs are retained between adjacent rows	29
Of these, the majority retain 2 pcs	17
Number retaining the maximum 4 pcs	6
Number retaining only 1 pc	6

Four pairs of adjacent rows share no pc intersection and all form octatonic scales

Of 17 occurrences where 2 pcs are retained, 13 retain pcs forming an ic 3. In all cases, except the two marked with asterisks, the pcs are retained in the same order positions. In the two cases marked, the outer elements of one row are retained as the inner elements of the next or viceversa.

Of the four times 2 pcs are retained which form ic 1, all but the one marked with an asterisk remain in the same order positions. In the special case, the elements forming the second half of the first row are retained as the first half of the next row.

throughout this section is the retention of two pcs between adjacent rows. Consistently, the two pcs form ic 3 and remain in the same order positions in both rows. Deviations from this norm indicate important formal points in the structure. For example, the beginning of both sections A and B are characterized by rows which retain the maximum number of elements (4). These rows all retain the pcs of the prime (10, 11, 1, 2). In addition, there are four pairs of rows which share no pc intersection and each occurs at an important formal point (beginning, centre and end of section A and near the end of section B). Each of these row pairs produces an octatonic scale. The octatonic scale, characterized by the alternation of ics 1 and 2, is available in only three different transpositions (see Figure 7.39).

Figure 7.39. Octatonic Scales

Scale 1 $0_2\underline{2}_2\underline{3}_2\underline{5}_2\underline{6}_2\underline{8}_2\underline{9}_2 11$

Scale 2 $0_1\underline{2}_3\underline{4}_2\underline{6}_1\underline{7}_2\underline{9}_1 10$

Scale 3 $1_2\underline{2}_4\underline{5}_2\underline{7}_2\underline{8}_2\underline{10}_1 11$

Stravinsky uses only versions 1 and 3 of the octatonic scale and their use is alternated.

The body of this section, then, concentrates on extending the serial unit. Three prominent techniques are utilized; the formation of octatonic scales, complete invariance between rows and adjacent rows which retain two pcs in the same order positions.

The conclusion of the Adagio section (a tempo, mm. 452-62) further extends the serial units. This section is shown in Example XVI and is initially characterized by the first violins stating the thirteen-

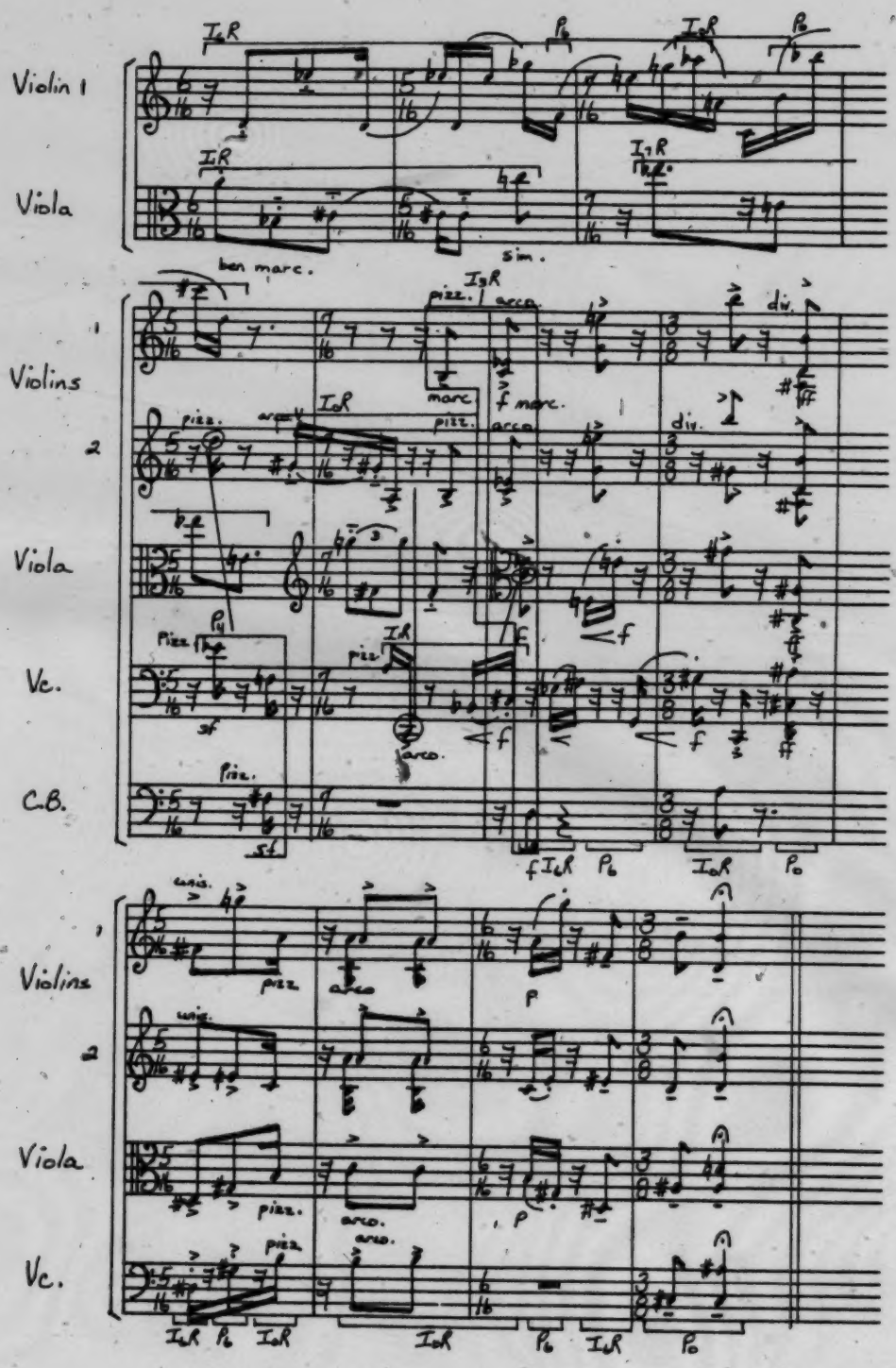
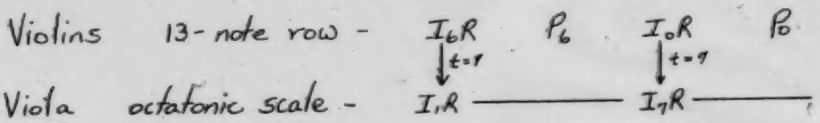
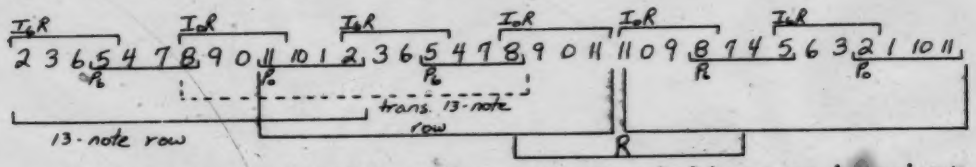
Example XVI. Agon, MM. 452-462 (P. 68, MM. 1-11).

note row. This serial extension features four four-note overlapping rows with one pc retained between each pair. The sequence of rows used is I_6R, P_6, I_0R and P_0. Accompanying the thirteen-note row is a row pair in the violas (I_1R-I_7R). This row pair produces version 2 of the octatonic scale (the last form of this scale to be presented). The placement of the octatonic scale at the beginning of this subsection is consistent with its use in the body of the Adagio. Also of significance is that the rows of the viola are related by transposition at t=7 to the first and third rows of the violin (see Figure 7.40).

Figure 7.40. Relationships between Violins and Viola in Conclusion



Continuing in the lower strings is the row pair P_4-I_0R, which produces octatonic scale version 1. The conclusion of this section consists of eleven series in a chordal texture. The rows used are all from the thirteen-note row as shown in Figure 7.41.. Throughout this entire

Figure 7.41. Series in Chordal Passage mm. 457-462



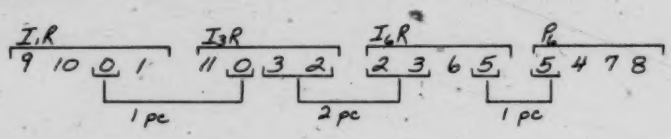
sequence each pair of adjacent four-note rows hold one pc invariant. The invariant pc in each case is only sounded once and appears as a common note between chords. The first four chords of this sequence produce the same thirteen-note row that the violins used in measure 452. The second row pair is the same as the first at t=6 and, therefore,

can begin a new thirteen-note row. This is precisely what happens in rows three through six. These rows produce a thirteen-note row related to the original by t=6. The pattern of rows, here, is I_6R, P_0, I_6R, P_6 which also indicates a rotation of the original beginning on the third four-note unit. Stravinsky seems to continue the cyclic generation with the last row pair of the second thirteen-note row (I_6R-P_6) being followed by I_0R. The process is not completed, however, with the absence of P_0. If the process had been completed, the original thirteen-note row would have been reproduced. Instead Stravinsky utilizes three, overlapping four-note units to produce a new thirteen-note row--P_0, I_6R, P_6 and I_0R. This new row contains the total chromatic, retains the same pcs as its initial and final element and contains one, overlapping pc between each four-note unit. These are all common characteristics between the original thirteen-note row and the new one. There is one difference, however, the original thirteen-note row is divisible into two, overlapping seven-note rows, each of which contains a chromatic collection spanning an ic 6. This is not true of the new thirteen-note row, but the inner and outer pair of four-note units satisfy this criterion. This new thirteen-note row is retrograded to complete the Adagio section.

In the lower strings and second violin of measures 456 and 457, there is a row pair (I_1R-I_3R) which functions as a transition between the linear and vertical treatments of the series. These two rows contain one pc intersection (pc 0), and produce all the chromatic pcs within an ic 6. These rows share all the characteristics of the seven-note row. If considered with the next row pair (I_6R-P_6), the total

chromatic is present with an interesting sequence of pc retentions, as shown in Figure 7.42. The sequence of pc retentions, 1-2-1, is

Figure 7.42. Sequence of Pc Retentions mm. 456-57

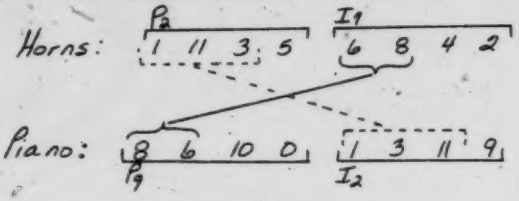


indicative of the twelve-note row. The most obvious difference between this sequence and the twelve-note row is that here, the order of the two initial four-note units are such that the common note does not function as a pivot note between rows. It is significant that in the opening measures of the Adagio and, here, in the concluding measures the structure of the twelve-note row is indicated, although the twelve-note row proper does not occur until the "Four Duos."

The Piu mosso section (mm. 463-494) is divided into three subsections. The outer subsections, for male dancer, are scored for three horns and piano while the central subsection, for female dancer, is scored for three flutes and strings. The whole-tone variant is utilized for the outer subsections and the prime is used for the central subsection.

The first subsection is a canon after one bar at t=7 between the horns and piano. There are only two serial statements in each canonic voice and linearly there is no pc similarity. If we consider both voices some interesting relationships emerge, as indicated in Figure 7.43. The transposition levels chosen preserve the maximum number of pcs between inversionally related sets (3 and 2). Also of importance is the placement of retained segments at the beginning

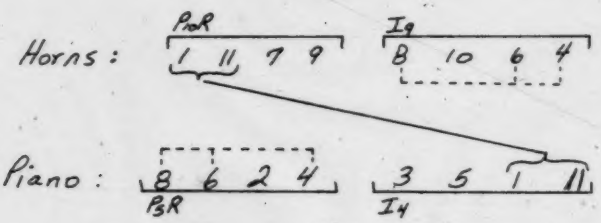
Figure 7.43. Piu mosso mm. 463-472



of each set, although internal reordering is evident. Within each voice order positions three through six form variant 3 (pcs 3, 5, 6 and 8 in the horns and pcs 10, 0, 1 and 3 in the piano). This variant also recurs, at a different transposition level, as a string chord which is reiterated from the end of this subsection through the central subsection (pcs 7, 9, 10 and 0).

The third subsection is constructed along very similar principles as the first (see Figure 7.44). The piano part here contains the same

Figure 7.44. Piu mosso mm. 484-490

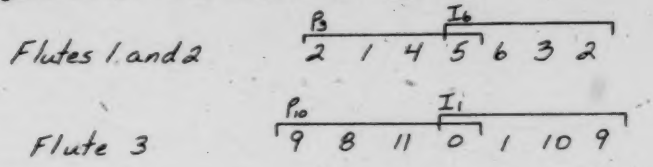


pc sets as the horn in the first subsection, although the sets are now reversed and their internal order is permutated. Again relationships exist between lines which retain three and two pcs, but now these segments are not contiguous. The placement of invariant pcs is retrograded. Among all the rows of the first and third subsection one of two pc pairs are held invariant, either 1-11 or 6-8.

The second subsection, for female dancer, is a canon in double augmentation between the first and second flute in unison and the third

flute at ic 7. The canon is accompanied by the variant 3 string chord mentioned earlier. The greater part of this subsection is constructed from the alternation of two sets in each canonic line, as shown in Figure 7.45. Each canonic line retains its outer elements in retrograde

Figure 7.45. Piu mosso mm. 473-483

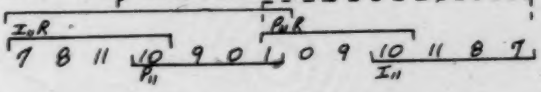


order. For the most part, the sets are arranged so that the common notes overlap and act as pivot notes. Each canonic line provides all the chromatic pcs within an ic 5 and they maintain distinct pitch areas. These two chromatic collections have one pc in common (pc 1) and as a result pc 7 is omitted from the canonic lines. Pc 7 recurs in the repeated string chord and as a result the total chromatic is present throughout this central subsection. Neither of the outer sections contain the total chromatic.

The coda (mm. 495-519) is the third and final section of the "Pas-de-Deux." This section is in a ternary form ABA (coda, "doppio lento" and "quasi-stretto"). The "quasi-stretto" is a shortened version of the initial coda.

The coda, for the most part, consists of four statements of the four-row sequence shown in Figure 7.46. There is only one pc sounding

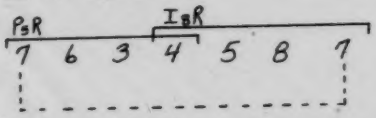
Figure 7.46. p Coda mm. 495-502 R



at any time resulting in a monodic presentation. This sequence of rows contains all four row forms at the same transposition level and contains all the pcs in an ic 6 (pcs 7-1). Each row pair in this sequence is a seven-note row and the two seven-note rows are related by retrogression.

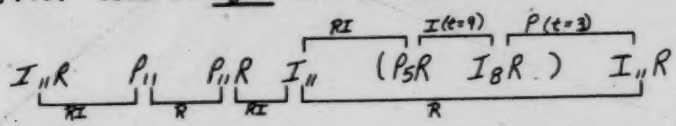
Within this passage there is one extraneous row pair, in the brass and piano of measure 496, which does not fit into the above-mentioned pattern. This interruption occurs after the initial four-row statement and consists of the rows P_5R and I_8R (see Figure 7.47). At

Figure 7.47. Coda m. 496



first this row pair appears to be a seven-note row, but on further examination it is found to contain all the pcs within only an ic 5. This is not a seven-note row but rather two rows related by inversion at t=9. This row pair is unique in that no other adjacent rows within this passage are related by inversion. This interruption continues logically from the initial four-row statement by maintaining the technique of adjoining rows by one overlapping pc. The interruption varies from the initial statement by additional means of relating adjacent rows (see Figure 7.48). This figure illustrates the alterna-

Figure 7.48. Coda of Agon mm. 495-497



tion of retrograde and retrograde inversion relationships within the

original four-row unit and the inclusion of inversional and prime relationships within the interruption.

These additional rows also extend the total pc content of the passage from the chromatically-filled tritone of the four-row unit to eleven pcs (addition of pcs 3, 4, 5 and 6), with pc 2 not included.

The next passage, "doppio lento", utilizes the prime row and one occurrence of variant 3 (harp, m. 505). The greater part of this passage is developed from two collections and their invariant permutations: $P_{,}R$ pcs 3, 2, 11 and 0 (I_3, $P_{,}$) and $I_{,}R$ pcs 9, 10, 1 and 0 ($I_{,}$). These two pc collections account for ten of the total eighteen statements within this passage. Together these two collections produce another chromatically-filled tritone but now the extremities are pcs 9 and 3. This section actually begins in measure 502 with the statement of I_0R in the harp and tympani and the lower limit of the pc collection (pc 9) is emphasized by its reccurrence throughout these two measures.

From the basis of the chromatically-filled tritone (pcs 9-3), we find that throughout this section that the total pc content is systematically enlarged. P_{10} and its permutations ($P_{10}R$ and I_6) chromatically extend the total pc content to an ic 7 with the addition of pc 8. These rows, which account for four serial statements, are concentrated in measures 507 to 508. Variant 3 and I_4, which occur successively in the harp and mandolin (mm. 505-507), add another chromatic pc (4), which further enlarges the total pc content. From measures 509 and 510 there are two more rows, P_7R and P_5R, which complete the process by adding pcs 5, 6 and 7 respectively. We find, then, that throughout

this passage the pc content is gradually extended from the original chromatically-filled tritone (9-3) to the total chromatic.

The return of the A section ("quasi-stretto", mm. 511-519) is a shortened version of the initial section, but reestablishes the monodic texture of the previous section. The seven-note row and its retrograde (I_{11}R, P_4, P_{11}R and I_4) are stated only once but are extended by two rows (P_5R and I_5). The last four rows of the movement--P_4R, I_4, P_5R and I_5--produce a thirteen-note row. The final pc of the movement (pc 0) is the first note of the initial row of the following movement and functions to bind the two movements together. Further, the monodic presentation of this closing section anticipates the texture of the following movement.

"Four Duos"

The "Four Duos" is the shortest movement in Agon, consisting of only nineteen measures. The pitch material of this movement derives from the twelve-note row shown in Figure 7.49. There are but seven

Figure 7.49. Twelve-tone Row of "Four Duos"

P_3 = 0 3 4 1 2 11 10 7 8 9 6 5
(3 -1 -3 -1 -3 -1 -3 -1 -1 -3 -1)

serial statements in this miniature movement and the last one carries over to the beginning of the "Four Trios." Two instrumental groups are juxtaposed in this movement, the lower strings and two trombones (one tenor and one bass).

The serial structure of this movement is shown in Figure 7.50. There are only four different rows used. Of particular interest is the

Figure 7.50. Serial Statements in "Four Duos"

Trombones			P_0			I_0	
Strings	I_0	P_0R		P_0	$I_{10}R(R_0I)$	$I_{10}R(R_0I)$ (incomplete)	

fact that $I_{10}R$, although it appears to be the only transposition, is the untransposed inversion of the prime retrograde. The instrumentation suggests a binary structure with two row statements in the strings and one in the trombones and then a repetition of this pattern. The final series ($I_{10}R$) serves as a coda and links this movement to the next.

Vlad comments:

> In the Duos, the music seems to have been reduced to a structural pattern pure and simple, a conventional catalogue of abstract serial modules. . . . Passages like these invite the sort of criticism that Adorno levelled at some of Webern's works, where he feels that the composer has given up the idea of 'composing' in the sense of a personal creative effort and has simply indulged in a mechanical, impersonal jotting down of lifeless serial formulas.[10]

I agree with Vlad that this is essentially a very straightforward presentation of serial statements, but Vlad has misunderstood the significance of this simple movement.

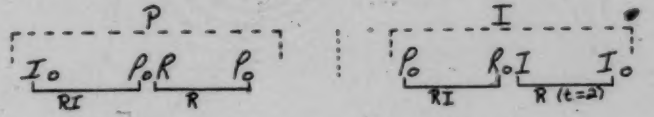
It should be noted that this is the first presentation of the twelve-note row. Certain characteristics of its structure should be recalled. The twelve-note row is constructed from four overlapping four-note rows with the sequence of overlapping being 1-2-1. Further, it is divisible into two seven-note rows with two pcs in common. The use of variant 1 is characteristic of the initial tetrad. The construction of this row and the thirteen-note row are very similar. In the construction of this twelve-note row, then, we can see evidence of the prime, variants of the prime and the seven-note row and similarity

of structure with the thirteen-note row.

Throughout the preceding movement, "Pas-de-Deux" the longest in Agon, all of the above-mentioned material is utilized except the twelve-note row. Within the introduction of the "Pas-de-Deux", the structure of the twelve-note row was present but was obscured by voice changes and the use of variants. It appeared at this point that Stravinsky was not sure which variant should function as the prime. From this implied version of the twelve-note structure, Stravinsky first broke it down into its constituent parts by defining the prime and then rebuilt longer serial statements by the use of seven- and thirteen-note rows. When the twelve-note row proper is introduced, it is done in such a simple way because the "Four Duos" act as a summation or conclusion for the materials used throughout the "Pas-de-Deux."

Also of significance is the similarity of construction between the coda of the "Pas-de-Deux" and the "Four Duos." The most obvious similarity is the use of all serial forms at the same transposition level (t=11 in the coda and t=0 in the "Four Duos"). It is interesting that both retrograde inversion forms are used, $I_{11}R$ or the retrograde of I_{11} in the coda and R_0I or the inversion of P_0R in the "Four Duos." Rows from the coda were related by retrograde and retrograde inversion relations alternately. This technique is utilized for adjacent rows in the "Four Duos", as shown in Figure 7.51. The coda includes

Figure 7.51. Row Relationships in "Four Duos"



one instance each of rows related by inversion and prime. The inversion relation, which was only hinted at previously, becomes a significant structural feature in the "Four Duos", with the second half of the movement being an inversion of the first half. The monodic presentation of the outer sections of the coda is retained throughout the present movement. The closeness of these two movements is further strengthened by the coda's final note anticipating the initial note of the "Four Duos."

We find, then, that although the surface features of this movement are uncomplicated, the material and the structure are closely related to the previous movement. The simplicity serves to establish these relationships.

"Four Trios"

The "Four Trios" is the last movement in Agon and utilizes the most varied pc structures. Included in the texture are the twelve-note series from "Four Duos" and the four-, seven- and thirteen-note rows first explored in the "Pas-de-Deux."

This movement utilizes a fugal exposition with four entries, which are shown in Figure 7.52. The rows stated are all versions of

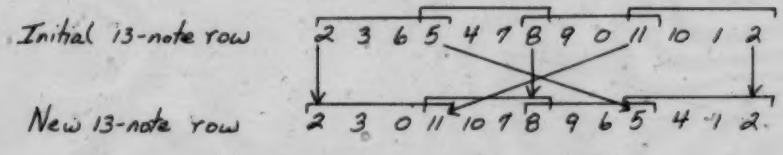
Figure 7.52. Fugal Exposition in "Four Trios" mm. 539-552

1. violins and violas — $P_1R - P_1$
2. violas and 'celli — $P_0R - P_0$
3. 'celli and basses — P_2R - 13-note row
4. violins, violas and trumpet 1 — $P_1R - P_1$; P_1R in augmentation

the twelve-note row, except the thirteen-note row in the third entry. The transposition levels chosen for the entries reflect traditional relationships (pcs 0, 5, 7 and 0). The rhythm of the canon is derived from the trombone passage in the "Four Duos."

Three of the fugal entries are immediately followed by the prime form at the same transposition level. This results in retrograde relationships within each canonic line. It is interesting that where one would expect to find P_2 (following P_2R), it does not appear. In its place is the thirteen-note row, its only occurrence in this movement. It should be recalled that with its first presentation in the "Pas-de-Deux", it was identified by four overlapping statements of the four-note row, each pair having one note in common and retaining pc 2 as the initial and final element. Here, pc 2 is retained as the initial and final element of the set. Also preserved are the common pivot notes between the four-note sets (although in retrograde order), while the internal dyads of each set are different (see Figure 7.53). This row

Figure 7.53. Thirteen-note Row from "Four Trios"



appears in measures 547 to 549 in the trombone, viola and 'cello. No retrograde relationship is effected between this row and P_2R other than the same final element.

The counterpoint to this fugal exposition is constructed from the four- and seven-note rows. It is virtually a compendium of structures and relationships available between adjacent rows. These

relationships are shown in Figure 7.54. In eleven cases, linearly adjacent rows share a common pivot note. Twice, linearly adjacent rows are related by retrogression and five times, they are related by retrograde inversion. In four out of these five occurrences, a seven-note row is formed. Out of seven instances where adjacent rows share two common pcs, four preserve a 1 dyad, while three retain a 3 dyad.

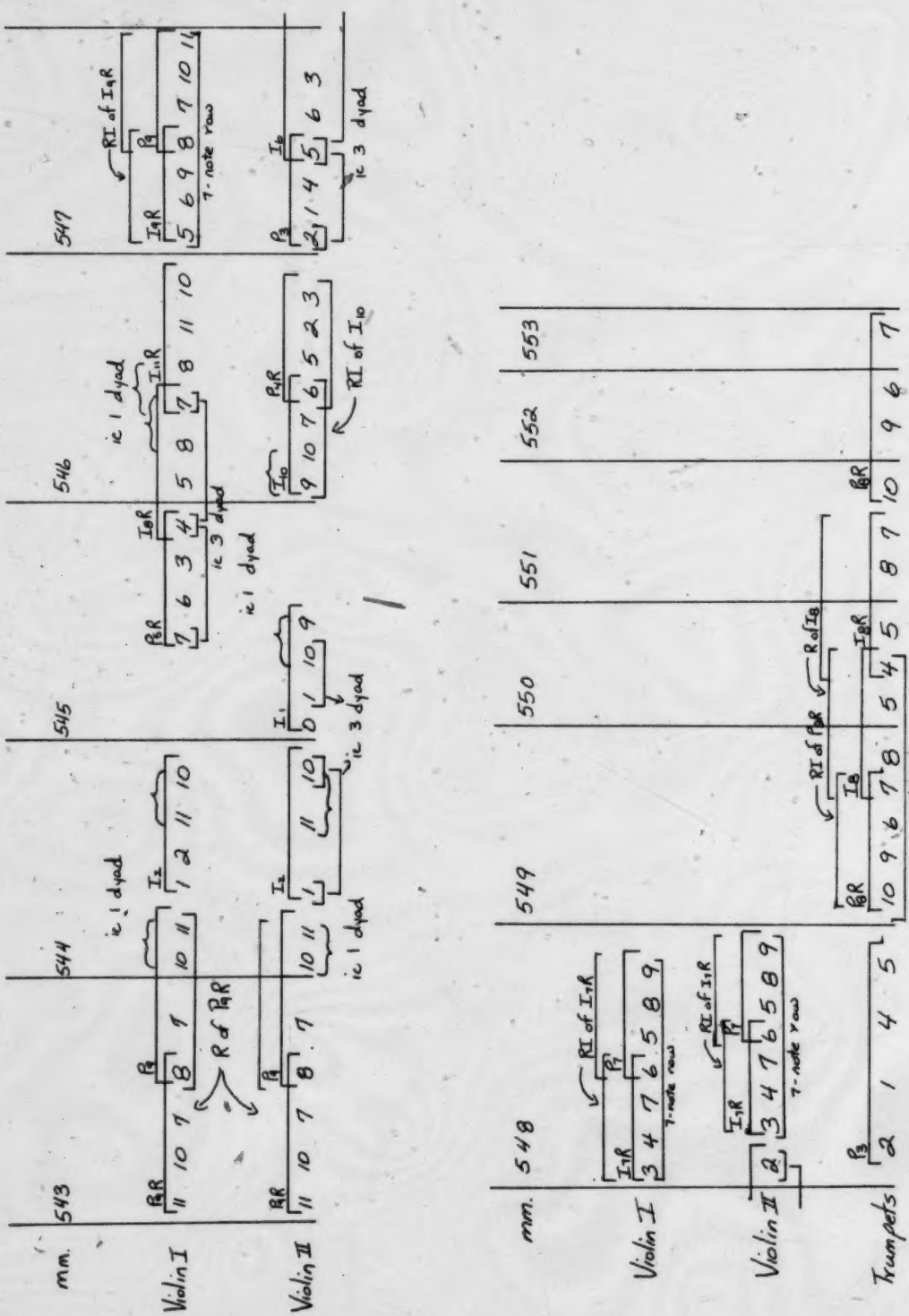
From measures 553 to 560, there is a repeated four-note chord in the horns. Three of these notes complete rows left incomplete at the end of measure 552. The second horn, however, states three pcs from I_7, with the final pc (3) occurring later in the lower strings.

Below this chordal accompaniment, there are two final twelve-note rows in the low strings. The two rows are $I_{10}R$ and P_0, which have a retrograde-inversion relation. This is the only instance in this movement where this type of relation between rows involves transposition (here, t=2). This extends the retrograde-inversion relation inherent in the seven-note row over a longer context.

The coda of this movement (m. 561 and on) is an almost exact recapitulation of the opening "Pas-de-Quatre" and is nonserial in structure.

In conclusion, we find that the overall organization of section four is loosely symmetrical. The "Pas-de-Deux" and "Four Trios" are similar in two important aspects. The first aspect of similarity is the use of a wide variety of material. The "Pas-de-Deux" utilizes the four-note row and its variants, and the seven- and thirteen-note rows, while the "Four Trios" uses all this material in combination with the

Figure 7.54. Counterpoint to Fugal Exposition



twelve-note row. The serial structures also evince similarity. Both movements relate adjacent rows in three ways:1) by serial operations, particularly retrograde and inversion, 2) combining four-note rows into extended serial units such as the seven- and thirteen-note rows, and 3) the repetition of pcs between adjacent rows, particularly two pcs forming either ic 1 or 3.

The "Four Duos", however, which forms the centre of the symmetry has a much simpler format. This movement utilizes only the twelve-note row and the relationships between rows involve all serial operations (P, R, I and RI).

The outer movements, then, are more complex, both in the material they utilize and the relationships inherent in the structure, while the central movement is restrictive in its use of material and in the relationships utilized.

NOTES

[1]White, Stravinsky, p. 490.

[2]Analysts of Agon are not in agreement on the large formal divisions of this work. The division which I have chosen is that of Lawrence Morton and Eric Walter White. I have chosen this plan because the Prelude and Interludes are musically similar enough to be heard as ritornelli or at least some kind of return which divides the music around it. This plan also produces a loosely symmetrical structure (which is common in Stravinsky's works) and is consistent with the use of various rows. For a review of other opinions see Howard Janzen, "A Stylistic Analysis of Stravinsky's 'Agon'," (M.Mus. thesis, University of Alberta, 1975), pp. 10-12.

[3]There appears to be some confusion as to the identification of the prime series used in this work. The series, which I chose as primes, are consistently the initial statements of the series in the movement or section based on that series, with the exception of the row used in the "Four Duos." The variety of prime forms found in the literature is summarized as follows. For the Coda of the second section, Vlad, Keller and Wolternik all use I of mine as the prime. For the "Bransle Double" row Vlad uses P of mine as the prime. For the twelve-note row from the fourth section, Vlad and Keller use P R of mine as the prime, while Morton and Ward-Steinman use I of mine as prime.

[4]Wolternik alone has alluded to these subsidiary rows, which are significant to the musical construction, although they dictate only a moderate amount of material in each movement. Therefore, the primary rows are more significant to the construction and the subsidiary rows are secondary. See Wolternik, "Harmonic Structure," p. 280.

[5]Ibid., pp. 274-78.

[6]H. Pousseur, "Stravinsky by Way of Webern The Consistency of a Syntax," Perspectives of New Music (part 1, Spring/Summer, 1972), pp. 13-51 (part 2, Fall/Winter, 1972), pp. 112-145. Pousseur goes into extreme detail regarding the structure and usage of these two rows.

[7]Wolternik, "Harmonic Structure," p. 309.

[8]Ibid., p. 295.

[9]Pousseur, "Stravinsky," Part 1, p. 34.

[10]Roman Vlad, Stravinsky, 3rd ed. (London: Oxford University

Press, 1978), pp. 207-08.

CHAPTER 8: CONCLUSIONS

This chapter will examine this collection of works, identifying similarities and differences within the group. Five different areas will be examined: nature of serial material throughout the group, similarities between the rows, structural techniques which occur frequently within the group of works, methods of extending or shortening the serial segment and large structures involving movements or sections of movements.

The nature of serial material deals with the type of rows used in each work and the amount of material which is directly derived from the series. The two earliest compositions, Cantata and Septet, both utilize rows which contain more than ten elements but lack the total chromatic. Within each of these rows, then, nonconsecutive pc repetition is present, often in combination with the repetition of two- or three-note segments. Of the seven movements of the Cantata, only the central one contains serially derived material and nonserial material is also included. Within the three-movement Septet, two movements contain serially derived material. The Passacaglia uses only the ordered series and nonserial counterpoint. The Gigue, which uses both the ordered and unordered versions of the series, contains no nonserial material. The Gigue emerges as Stravinsky's first movement constructed wholly from serial material, although the nontraditional technique of using both ordered and unordered versions of the series is also included.

The next work, Three Songs from William Shakespeare, uses much shorter series. There are two series and neither contains pc repetition. The row of the first song contains only four elements, while that of the second and third songs contains seven. Although this is the first example of a work in which all movements contain serially derived material, each movement also contains some nonserial material. The series of In Memoriam Dylan Thomas is also short, containing only five elements which form a chromatic collection. This is the first example in which all material within the work is serially derived and, further, it is all derived from the same series. Within Canticum Sacrum Stravinsky utilizes a twelve-note row for the first time. The nature of serial material, however, seems to regress. Only the three central movements contain serial material and no nonserial material is included in these movements. There are two distinct rows used in this work, one for the second movement alone and the other for the third and fourth movements. The last completed work to be examined, Agon, utilizes a wide variety of materials. This work uses three different twelve-note rows which are each confined to one section of the work. Only three of the four sections contain serially derived material and of these only one, section three, contains only serially derived material. Within the material of sections three and four, short rows of four or six elements are used and each is related to the twelve-note row of its section. The works following these utilize one twelve-note row to derive all material within a work.

The similarities between rows will be examined in various

categories: similar pc collections in sections of rows, structural similarities between rows and ic similarities between rows. All rows used in these works are shown in Figure 8.1. Similar pc collections within sections of rows are rather rare, occurring only twice. The first involves identical hexachordal pc content between the first Canticum Sacrum row and the row from the second section of Agon. The hexachords appear in retrograde placement between the two rows. The second involves the total pc content of the In Memoriam row which occurs as the first five elements of the fourth section row of Agon. Structural similarities are divided into two types. The first type involves the pc content of the series from Septet and that from "Full fadom five" of Three Songs. The latter contains eight elements, while the former contains only seven. The structure of these two collections is similar, each containing two tetrachords which are identical under transposition at t=5 and t=7. This is similar to the structure of a major scale and, in fact, the pc content from "Full fadom five" is a major scale. The second type of structural similarity is the use of chromatic collections. This occurs in three rows. Each hexachord of both the fourth section row of Agon and the second Canticum Sacrum row contains a chromatic pc collection, as does the entire row of In Memoriam. Within several works row pairs are frequently used which form chromatic pc collections. A collection chromatically filling an ic 6 is produced from row pairs in "Ricercar II" of the Cantata, In Memoriam and the row from the fourth section of Agon, while a collection spanning ic 5 is formed in the first of Three Songs. Ic similarities

Figure 8.1. Rows from Works in this Study

Cantata- "Ricercar II"

$P_0 = 4\ 0\ 2\ 4\ 5\ 3\ 2\ 4\ 0\ 2\ 11$ (4-2 -2 -1 -2 -1 -2 -4 -2 -3) $\langle 4,3,3,2,2,1 \rangle$

pc content $\{11,0,2,3,4,5\}$

Septet- Passacaglia and Gigue

$P_0 = 4\ 11\ 9\ 7\ 6\ 8\ 1\ 11\ 7\ 6\ 8\ 7\ 9\ 0\ 8\ 9$ (5-2-2-1-2-5-2-4-1-2-1-2-3-4-1) $\langle 5,5,5,5,6,2 \rangle$

pc content $\{4,6,7,8,9,11,0,1\}$ (2-1-1) (2-1-1)

Three Songs from William Shakespeare-

"Musick to heare" $P_0 = 11\ 7\ 9\ 10$ (4-2-1) $\langle 2,2,1,1,0,0 \rangle$

"Full fadom five" and "When Dasies pied" $P_0 = 3\ 1\ 6\ 5\ 10\ 11\ 8$ (2-5-1-5-1-3) $\langle 2,5,4,3,6,1 \rangle$

pc content $\{1,3,5,6,8,10,11\}$ (2-2-1) (2-2-1)

In Memoriam Dylan Thomas-

$P_0 = 4\ 3\ 0\ 1\ 2$ (1-3-1-1) $\langle 4,3,2,1,0,0 \rangle$

Canticum Sacrum-

C.S. (1) $P_0 = 8\ 7\ 5\ 2\ 4\ 6\ 4 \mid 3\ 1\ 10\ 0\ 11\ 9$ (1-2-3-4-2-1 | 1-2-3-2-1-2)

C.S. (2) $P_0 = 9\ 8\ 10\ 0\ 1\ 11 \mid 4\ 3\ 6\ 2\ 5\ 7$ (1-2-2-1-2-5 | 1-3-1-4-3-2)

Agon-

Second Section $P_0 = 9\ 11\ 10\ 0\ 1\ 3 \mid 4\ 6\ 5\ 7\ 2\ 8$ (2-1-2-1-2-1 | 2-1-2-5-6)

Third Section $P_0 = 0\ 2\ 3\ 5\ 4\ 9 \mid 7\ 8\ 10\ 11\ 1\ 6$ (2-1-2-1-5-2 | 1-2-1-2-5)

Fourth Section "Pas-de-Deux" $P_0 = 11\ 10\ 1\ 2$ (1-3-1) $\langle 2,1,2,1,0,0 \rangle$

"Four Duos" and "Four Trios" $P_0 = 0\ 3\ 4\ 1\ 2\ 11 \mid 10\ 7\ 8\ 9\ 6\ 5$ (3-1-3-1-3-1 | 3-1-1-3-1)

result in equivalent pc segments and these are quite numerous. One five-note segment is equivalent between the "Bransle Double" row (order positions one through five) and the row from the second section of Agon (order positions five through nine). Equivalent four-note segments are more common occurring four times. Order positions four through seven of the second Canticum Sacrum row are equivalent to order positions eight through eleven of the row from the second section of Agon. Order positions nine through twelve of the second Canticum Sacrum row are equivalent to order positions twelve through fifteen of the ordered row from the Septet. The pc content of the first of Three Songs is equivalent to order positions four through seven of the first Canticum Sacrum row. Finally, the four-note row from Agon is equivalent to the first four notes of the In Memoriam row. Equivalent segments involving three pcs and, therefore, two ics are too numerous to detail. Figure 8.2, however, lists the common ic pairs and the frequency of each.

Figure 8.2 Frequency of Ic Pairs

Ic pair	Frequency
1-2	23
1-3	15
2-5	10
2-4	7
4-3	5
5-1	2

There are two structural techniques which occur frequently throughout this group of works. In five out of six works examined chromatic pc collections become structurally significant. Every work is involved except the Septet. Within "Ricercar II" of the Cantata,

the row pair P_0-I_8 displays maximal invariance under transposition and also chromatically fills an ic 6 (pcs 11-5). The "cantus cancrizans" section utilizes only this row pair and its retrograde, establishing both maximal invariance and a basis of pc content. Throughout the canon section this pair of rows occurs simultaneously at the beginning of each odd-numbered canon and at the beginning of the sixth and eighth canons. Additional row pairs are stated in the even-numbered canons and all invariant segments are subsets of these tritone collections. We find, then, that the row pair P_0-I_8 initiates both invariance as a structural property and a basis of pc content. Both of these principles are extended throughout the even-numbered canons and culminate in the high level of invariance displayed in the eighth canon. In the first of Three Songs, the row pair P_0-I_9 produces a chromatically filled ic 5. This row pair appears in the flute line (mm. 1-8) and then consistently in the vocal part throughout the body of the song. The accompaniment utilizes a variety of row pairs. At times complementary row pairs are used which result in the total chromatic. Row pairs related by t=1 are often used adjacently, which results in the chromatic collection being extended to an ic 6. Throughout the Three Songs, the tonal centres of each song also form a chromatic collection (pcs 0-3).

The row of In Memoriam is a chromatic collection (pcs 0-4). The row pair P_0-I_{10} consistently recurs in the ritornelli of the "Dirge-Canons" and forms a chromatic collection filling an ic 6. The chromatic collection of the ritornelli is surrounded by the

total chromatic in the canonic sections and provides a point of departure for pc content. The formation of row pairs which chromatically fill a tritone is the primary technique used to extend serial units throughout this work.

The row of the second movement of Canticum Sacrum includes two hexachords which are identical under inversion. Throughout this movement the tenor line utilizes a pair of isolated hexachords ($P_0R(A)$-$I_8R(A)$) which produce an interesting combination of near-maximal invariance and minimal reordering. These hexachords also produce all chromatic pcs within an ic 6 (pcs 9-3) and are related by implied retrograde motion. The retrograde relation initially developed within this hexachord pair is extended to encompass each of the three internal divisions of the movement and the movement as a whole. The row used for the third and fourth movements includes hexachords which are identical under inversion and transposition. Further, each hexachord is a chromatic collection spanning an ic 5. The structural nature of the hexachords is such that combinatorial properties allowing for the presence of both aggregate and secondary sets are made available. Aggregate sets are concentrated in the central submovement, "Spes," but all sections contain either secondary or aggregate sets.

Within the fourth section of Agon, the seven-note row produces a chromatic collection spanning an ic 6. The seven-note row becomes structurally significant in the "Pas-de-Deux" and the "Four Trios." Included in the "Pas-de-Deux" are other chromatic collections, namely the ic 5 collection within each line of the central

section of the Piu mosso and the row pairs which chromatically fill an ic 5 in the Coda. In addition, the B section of the Coda establishes the chromatic collection of pcs 9 through 3 as the basis of pc content and then systematically extends this collection to the total chromatic.

The second structural similarity between works of this study is Stravinsky's concern for nonconsecutive repetition of pc. In the early works, Cantata and Septet, nonconsecutive pc repetition is evident in the series itself and is furthered by pc retention between rows in close proximity. With the short series used in Three Songs and In Memoriam, nonconsecutive pc repetition is established by combining short serial units into larger units, often including pc repetition and forming chromatic collections. Within In Memoriam, this is also achieved by the adjacency of sets which contain the same pc content, particularly in the ritornelli of the "Dirge-Canons." In works involving twelve-note rows, Canticum Sacrum and Agon, this technique is based on the invariance of small pc segments. We find the recurrence of pcs or pc segments is consistently a concern throughout this group of works.

Another consistent concern throughout this group of works is the extension or contraction of the serial segment. Throughout the Cantata, row pairs forming chromatically-filled ic 6 are the principal means of extending the serial material. The serial segment of Septet is long, containing sixteen elements with pc repetition, and the main method of contracting the serial segment is to use it as an unordered set, as is done in the Gigue. The serial segment of the first of

Three Songs is very short and consistently the segment is extended by combining two or three rows (P_0 -I, -P_0). The third song in this work uses a five-note skeletal row and consistently fills the skeleton diatonically to lengthen the serial segment. With In Memoriam, the serial segment is consistently extended by the use of row pairs which form chromatic collections. Within Canticum Sacrum, two twelve-note rows are used and in each case hexachords are used independently. Invariance of two-, three- and six-note segments are significant in the use of both rows and the second row also utilizes the combinatorial possibilities of both aggregate and secondary sets. The fourth section of Agon is based on a four-note row and extensions of the serial segment include the seven-, twelve- and thirteen-note rows, all of which are structurally significant. The third section of Agon independently utilizes both hexachords and twelve-note rows. Either the extension or contraction of the serial segment consistently occurs throughout these works.

Formal structures at the movement or large section level all document Stravinsky's sensitivity to music of the past. Structures that are used include symmetrical, bipartite, canonic, ternary, five-part and strophic movements. The movements or sections of movements cast in these structures are summarized in Figure 8.3. Five-part structure occurs only once within this group of works, as does strophic structure. Both of these movements are the central movements or sections within the work and their unique structures highlight their prominent placement. In both cases, the movement which utilizes the unique structure also serves as the focal point of an

Figure 8.3. Structures used in these Works

Symmetrical-	Passacaglia, Septet
	"Musick to heare," Three Songs
	"When Dasies pied," Three Songs
	"Surge, aquilo," Canticum Sacrum
	"Brevis," Canticum Sacrum
Bipartite-	"Ricercar II," Cantata
	"Caritas" of "Ad Tres," Canticum Sacrum
	"Fides" of "Ad Tres," Canticum Sacrum
	Coda of Second Section, Agon
	Adagio of "Pas-de-Deux," Agon
	"Four Duos," Agon
Canonic-	Gigue, Septet
	"Full fadom five," Three Songs
	"Dirge-Canons," In Memoriam
	"Four Trios," Agon
Ternary-	"Bransle Simple," Agon
	"Bransle Gay," Agon
	"Bransle Double," Agon
	Piu mosso of "Pas-de-Deux," Agon
	Coda of "Pas-de-Deux," Agon
Five-part-	"Spes" of "Ad Tres," Canticum Sacrum
Strophic-	Song, In Memoriam

overall symmetrical structure which encompasses the entire work. The other four structures appear throughout the group of works and all occur in near equal frequency.

Within most movements, although traditional structures are used, there is usually some nontraditional element included. For example, the second and fourth movements of Canticum Sacrum are both symmetrically structured but each contains additional material in the second half of the structure. The inclusion of this material tends to negate the balance of symmetry, which has been strongly established. Within the bipartite structures, the sections often reflect traditional structures. For example, in "Caritas" and "Fides" of "Ad Tres" in Canticum Sacrum, the A sections are individuated by the symmetrical structures while the B sections exhibit canonic textures. Within the canonic structure of the "Dirge-Canons" of In Memoriam a nontraditional element is introduced: minimal rhythmic imitation combined with pitch imitation. Within the canonic lines of the "Four Trios" in Agon, retrograde relationships are established in all except one line, which does not even use the same type of serial material (twelve-note row followed by a thirteen-note row). We find that nontraditional elements add ambiguity to the structure in many movements.

> With regard to the serial technique as such, Stravinsky seems to owe more to Webern than to Schoenberg. He favours the linear unfolding of the series into chain-structures, rather than its bending upon itself in order to form ring-structures and establish harmonic fields from within, i.e. with the series' own intervals (though the opening bar of 'Surge, aquilo' provides an instance of the latter procedure). In consequence he usually operates, rather like Webern, with two or more serial orders at a time. They are superposed in the traditional part-writing manner, and despite frequent crossings they generally

keep strictly to their respective paths.[1]

Throughout this group of works Stravinsky uses the series linearly and adds other statements as counterpoint. Although these are both typical of Webern's technique, there are other aspects of his technique which are not common to Webern's. Particularly in the early works, Stravinsky treated the series more like a theme than a row, with a narrow range and preservation of contour. Further, Stravinsky's series, for the most part, are stated in one timbre. Webern's series are generally sounded in a variety of timbres, although often the timbral changes reflect certain structural characteristics of the row. The statement of the theme in the Passacaglia of the Septet is a notable exception in Stravinsky's works, utilizing wide intervals and four timbres.

NOTES

[1]Roberto Gerhard, "Twelve-Note Technique in Stravinsky," The Score 20 (June, 1957), p. 41.

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